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THE ARAB AND HIS HORSE.

A MANUAL

OF



MODERN FARRIERY;

EMBRACING

THE CURE OF DISEASES

INCIDENTAL TO

HORSES, CATTLE, SHEEP, SWINE, AND DOGS;

WITH

INSTRUCTIONS IN RACING, HUNTING, COURSING, SHOOTING,
FISHING, AND FIELD-SPORTS GENERALLY:

TOGETHER WITH

A SUMMARY OF THE GAME-LAWS.

~~~~~  
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DESCRIPTION OF THE PLATES.

PLATE I.

This is to illustrate the different external Parts of the Horse, which are all named on the plate.

PLATE II.

Represents the Skeleton of the Horse, exhibiting its Position when covered by the Muscles.

Fig. 1, 1. The seven cervical vertebræ, or bones of the neck.

2. The sternum, or breast-bone.
3. The scapula, or shoulder-blade.
4. The humerus, or bone of the arm.
5. The radius, or bone of the fore-arm.
6. The ulna, or elbow.
7. The cartilages of the ribs.
- 8, 8. The costæ, or ribs.
9. The carpus, or seven bones.
- 10, 10. The metacarpal, or shank bones: the larger metacarpal, or cannon, or shank-bone, in front; and the small metacarpal, or splint-bone, behind.
11. The upper pastern.
12. The lower pastern.
13. The coffin-bone.
- 14 to 14. The eighteen dorsal vertebræ, or bones of the spine.
15. The six lumbar vertebræ, or bones of the loins.
- 16, 16. The haunch, consisting of the ilium, the ischium, and the pubis.
- 17, 17. The femur, or thigh-bone.
- 18, 18. The stifle-joint, with the patella, or knee-cap.
- 19, 19. The tibia, or proper leg-bone.
20. The fibula.
- 21, 21. The tarsus, or hock.
22. The metatarsal bones of the hind-leg.
- 23, 23. The pastern of the hind-feet, including the upper and larger bone, (fig. 23,) the lower pastern, (fig. 25,) and the coffin-bone. (fig. 24.)
- 26, 26. The caudal vertebræ, or tail-bones.

See p. 189, &c.

PLATE III.

Fig. 1, exhibits the external Anatomy of the Head of the Horse.

- a, a. The orbicularis muscles, which surround the eye.
- b. The nasalis labii superioris.
- c. The dilator magnus.
- d. The dilator naris lateralis.
- e. The zygomaticus.
- f, g. The orbicularis oris.
- h. The buccinator, or trumpeter muscle.
- i. The depressor labii inferioris.
- j. Branches of nerves with small blood-vessels.

- k. The parotid duct.
- l. Position where the jugular artery and parotid duct re-appear.
- m. The vein and artery passing under the zygomatic arch.
- n. A branch of the fifth pair of nerves.
- o. The masseter, or chewing muscles.
- p. The stylo-maxillaris, or styloid.
- q. The maxillary gland.
- r. The sub-maxillary and branch of the jugular arteries, and parotid duct passing under the angle of the lower jaw.
- s. The subscapula hyoides.
- t, w. The sterno maxillaris.
- u. The levator humeri.
- v. The jugular, or neck vein.
- x. The tendon common to the complexo major and the splint tendon.
- y. The superior portion of the ligament of the neck.
- z. The superior portion of the parotid gland.

See p. 199, &c.

Fig. 2. Representation of the Palate and Teeth.

- a, a. The tushes, or canine teeth.
- b, b. The incisors, or cutting-teeth.
- c, c. The palatine nerve.
- d, d. The palate.
- e, e. The palatine artery.
- f, f. The palatine vein.
- g, g. A strip of the palate dissected up.
- h, h. The cheeks.
- i, i. The molars, or grinding-teeth.

See p. 198, &c.

Fig. 3. Internal Anatomy of the Horse's Head.

- a. The occipital bone.
- b. The frontal bone.
- c. The nasal bone.
- d. The tentorium.
- e. The occipital bone.
- f. The cerebrum, or brain.
- g. The cerebellum, or little brain.
- h. A portion of the medullary substance of the brain.
- i—m. The ligament of the neck, or pack-wax.
- j. The sphenoid bone.
- k. The cuneiform, or wedge-shaped process, or base of the occipital bone.
- l. The medulla oblongata.
- m. See i.
- n. The point of the atlas bone.
- o. First bone of the neck.
- p. The dentated, or tooth-shaped bone.
- q. The cartilage covering the entrance into the eustachian tube.
- r. The spinal marrow.
- s, a. The septum nasi.
- t, t. The septum nasi cut off at the lower part.
- u. The palate.
- v. The interior maxillary bone.

- w. The molar teeth, or grinders.
- x, x. The tongue.
- y. The posterior maxillary, or jaw, with its incisor.
- z. The lips.
- 1. The thyroid cartilage.
- 2. The epiglottis.
- 3. The arytenoid, or funnel-shaped cartilages.
- 4. The trachea, or windpipe.
- 5. One of the chords concerned in the voice.
- 6. The ventricle of the larynx.
- 7. The opening into the oesophagus.
- 8. The soft palate.
- 9. The muscle of the neck.
- 10. The cricoid cartilage.
- 11. The oesophagus, or gullet.
- 12. The upper incisor teeth.
- 13. The lower ditto.
- 14. The posterior maxillary or jawbone.
- 15. A portion of the os hyoides.

See p. 194, &c.

Fig. 4. Eye of the Horse.

The pupil is oblong, and placed transversely.

See page 201, &c.

Fig. 5. The Eye of the Horse.

- a, a, e, d. Four muscles of the eye.
- c. Hook holding up the muscle b, b.
- f. Another muscle of the eye.
- i. The iris of the eye.
- k. The pupil.

See p. 201, &c.

PLATE IV.

Teeth of the Horse from a week old to six years.

See page 213, &c.

PLATE V.

Teeth of the Horse from seven to fifteen years.

Fig. 1 to 6. Teeth from seven to seventeen years.

- 7. Tooth of a foal viewed anteriorly: a, the body of the tooth; b, the neck; c, the root.
- 8. Tooth of a foal, viewed from its inner surface.
- 9. Incisive tooth of a young horse, divided throughout: a, exterior cavity; b, extremity of the funnel.
- 10. Teeth of a very young foal, cut through, to show the central enamel.
- 11. Incisive tooth of a young horse, showing the lower portion of the funnel.
- 12. Incisive tooth of a horse, divided into two parts, its whole length.
- 13, 14, 15, 16, 17. Five transverse sections of the teeth of a young horse. See p. 229, &c.
- 18. Teeth of a horse which had attained his 76th year.

See p. 225 and 230.

PLATE VI.

Fig. 1. Muscles, &c. of the Fore-legs of the Horse

- a. A portion of the sterno maxillaris, p. 232.
- b, i, is a muscle which raises the shoulder, p. 233.
- c, d. The serratus major, p. 233.
- e, f. Portions of the trapezius muscle, p. 234.
- g. The pectoral muscle, p. 234.
- h. The antea spinatus muscle, p. 234.
- i. See the description at b, p. 235.
- k. The postea spinatus muscle, p. 235.
- l. This muscle gives action to the principal muscle extending from the shoulder to the lower bone of the shoulder, and is employed in drawing this bone towards the shoulder-blade,

and bending the whole of the limb. Exceedingly powerful action is required from this muscle, and consequently it is very tendinous, and is inserted in such a direction as to act with great mechanical advantage; and that advantage is increased in proportion to the slanting of the shoulder.

- m. The scapula-olecranon.
- n. The skin drawn back.
- o, q, t. Three divisions of a muscle, concerned with p in raising the arm, and of which they are the grand agents in extending.
- t. The middle flexor muscle, p. 235.
- u. One of the muscles which bend the arm, p. 235.
- w. The extensor of the leg, p. 236.
- x. The middle flexor, p. 236.
- 2. The external flexor of the leg, p. 236.
- 3. The principal artery, nerve, and vein, extending down to 7, 4, and 5.
- 7. The perforated flexor muscle, p. 236.
- 8. The subcutaneous vein of the side of the chest.

Fig. 2. Muscles on the Inside of the Shoulder.

- a. The flexor of the arm, p. 237.
- b, b. The pectoralis transversus, or muscle which crosses the breast, p. 237.
- c. Represents the disease called capped hock, p. 237.
- g. The internal flexor.
- f. The principal veins, nerves, and arteries of the shoulder and arm.

Fig. 3. Bones of the Fore-leg.

- a. The coffin bone, p. 244.
- b. The navicular bone, do.
- c. The lower pastern, or coronet bone, do.
- d. The upper pastern.
- e. The sesamoid bones.

Fig. 4, 5, and 6. Front view of the Pastern.

- a. The coffin bone, p. 245.
- b. The navicular bone.
- c. The lower pastern.
- d. The upper pastern.

Fig. 7. Nerve, Vein, and Artery of the Pastern and Foot.

- a. The sole of the foot, p. 245, &c.
- b. The horny crust.
- c. The fleshy or sensible lamina.
- d. The posterior lateral ligaments.
- e. The internal or sensible frog.
- f. The nerve which supplies the fore part of the foot with feeling.
- g. The lower part of the vein before the artery.
- h. The same vein spreading over the pastern.
- i. The continuation of the nerve s.
- j. The extensors of the foot.
- k. The perforans flexor tendon.
- l, m. The division of the nerve on the fetlock joint.
- n. The tendinous band on which the flexor works.
- o. One of the flexor tendons.
- p. The deeper flexor tendon.
- q. The artery between the vein and nerve.
- r. The vein before the artery.
- s. The nerve on the inside of the off leg.

Fig. 8. Illustrations of Defects of the Fore-leg

- a. Situation of sandcrack, p. 162.
- b. Ringbone, p. 126.
- c. Windgall, p. 120.
- d. Enlargement of the back sinews, p. 117.
- e. Splint, p. 114 and 246.
- f. The tying-in of the leg below the knee.
- h. Mallenders, p. 132.

Fig. 9. Crust or Wall of the Foot, p. 251.

- a. The coffin bone.
- b. The crust.
- c. The coronary ring.
- d. The sole.

Fig. 10. The Pastern and Foot, with their Bones and Integuments, p. 247.

- a. The coffin bone, p. 247, &c.
- b. The lower or smaller pastern bone.
- c. The upper or larger pastern bone.
- d. The shank bone.
- e. The sesamoid bone.
- f. The suspensory ligament.
- g. The tendon of the perforating flexor.
- h. The ligament reaching from the pastern to the knee.
- i. The small inelastic ligament.
- j. The extensor tendon.
- k. The continuation of the suspensory ligament.
- l. The navicular, or shuttle bone.
- m. The inner or sensitive frog.
- n. The ligament which unites the navicular bone to the coffin bone.
- o. The ligament which unites the navicular bone to the smaller pastern.
- p. The seat of lameness of the navicular joint.
- q. The sensitive sole of the foot.
- r. The coronary ring of the crust.
- s. The covering of the coronary ligament.
- t. The sensible laminae.
- u, v. The crust or wall of the foot.
- w. The place of bleeding at the toe.
- x. The horny sole.
- y. The cleft of the horny frog.

Fig. 11. The Crust of the Foot.

- a. The coronary ring, p. 253, &c.
- b. The small horny plates which line the crust.
- c. The laminae continued over the bars.
- d. The bars.
- e, e. Two concave surfaces of the inside of the horny frog.
- f. The cleft of the frog.
- g. The frog. See also fig. 12 *d, d*.
- h, h. The internal crust.
- i. The rounded portion of the heels belonging to the frog.

Fig. 12. The Sole of the Foot, &c.

- a, a. The crust, p. 256, &c.
- b. The sole.
- c. c. The bars.
- d, d. The frog.

PLATE VII.

Fig. 1. Muscles of the Outside of the Thigh.

- a. The great gluteus muscle, p. 238, &c.
- b. The outin gluteus muscle.
- c. The triceps femoris.
- d. The ischio-tibialis internus.
- e. The root of the tail, with its muscles.
- f. The tendinous expansion which binds and strengthens the muscles of the tail.
- g. The flexor metatars.
- h. The extensor pedis.
- j. The situation of the principal nerves before they pass under the skin.
- k. Muscle for extending the hock.
- l, p. The popliteus muscle.
- m, n. The peronæus.
- o. The flexor pedis.

Fig. 2. Chief Muscles of the inside of the Thigh.

- a Part of the sterno-maxillaris.

- b. The blood-vessels belonging to the groin, p. 240, &c.
- c, e. The graciles, or slender muscle.
- d, x. Course of the principal anterior arteries and veins.
- e. Continuation of the gracilis.
- f, g. The sartorius.
- h. The fascia.
- i. The great gluteus.
- j. A portion of the suspensory ligament.
- k. The peronæus.
- l. The popliteus.
- m. The flexor metatars, or tendon of the leg.
- n. The extensor pedes.
- o. Inside of the perforating muscle of the foot.
- p. The muscle held up.
- q. The flexor perforatus.
- r. Portion of muscle for extending the hock.
- s. Part of the flexor perforatus.
- t. The peronæus vein.
- u. The large cutaneous vein.
- v. The ligamentous bands.
- w. The metatarsal bones.
- y, y. The large cutaneous vein.
- z. The inguinal vein.

Fig. 3. Situation of Diseases of the Hind Leg.

- a. Grease of the foot, p. 144.
- b. Windgall, p. 120.
- c Capped hock, p. 131.
- d. Curb, p. 133.
- e, e. Position of thoroughpin, p. 130.

Fig. 4. *a*. Capped Hocks.Fig. 5. Thoroughpin, *b, b*, p. 130.Fig. 6, *e*. Bog and Blood-spavin, p. 140.

Fig. 7. Attachments in Front of the Pastern-bones, &c., page 247.

- a. The coffin bone.
- b, c. Branches of the suspensory ligaments.
- d. The back part of the upper pastern.
- e. The back part of the lower pastern.
- f. The back part of the sesamoid bones.
- g. The lower part of the shank bone.
- h. The lateral cartilages of the foot.
- i. The ligaments connecting the two pastern bones.

Fig. 8. Curb, *e*, p. 133.Fig. 9. Bone-spavin, *d*, p. 136.

PLATE VIII.

Fig. 1. Structure of the Hock-joint.

- a. The astragalus, page 241, &c.
- b. The inferior end of the tibia.
- c. The os calcis.
- d. The os cuneiforme magnum
- e. The os cuboide.
- f. The os cuneiforme.
- g. The splint bone.
- h. The upper end of the shank bone.

Fig. 2. Side View of the Bones of the Head.

- b. The parietal bone, p. 193, &c.
- e. The frontal bone.
- f. The zygomatic arch.
- g. The super-orbital foraminae.
- h. The lacrymal bones.
- i. The orbit which contains the eye.
- k. The nasal bone.
- l. The super-maxillary bone.
- m. The infra-orbital foramina.
- n. The opening into the nose.
- o. The inferior maxillary.

- p. The upper incisors
- q, q. The molars, or grinders.
- r. The posterior maxillary.
- t. The lower pastern of the under jaw.
- u. The under incisors.

Fig. 3. Bones of the Head. Front View.

- a. The occipital bone, p. 191, &c.
- b, b. The parietal bones.
- c, c. The temporal bones.
- d, d. The temporal fossa.
- e, e. The frontal bones.
- f, f. The zygomatic arch.
- g, g. The super-orbital foraminæ.
- h, h. The lachrymal, or tear bones.
- i, i. The orbits.
- j, j. The malar, or cheek bones.
- k, k. The nasal bones.
- l, l. The super maxillary bones.
- m, m. The infra-orbital foraminæ.
- n, n. The openings into the nose.
- o, o. The inferior maxillary of the jawbone.
- p, p. The upper incisors.

Fig. 4. The Stomach.

- a, a. The mucous portion, p. 272, &c.
- b, b. The portion covered by the cuticle, or skin.
- c, c. The margin which separates the cuticular from the villous portions.
- d. The entrance into the gullet.
- f. The œsophagus.
- g. The communication between the stomach and first intestine.
- i. A small orifice through which a portion of the secretion of the pancreas enters the intestines.
- j, k. The orifice through which the bile, &c., enters into the first intestine.

Fig. 5. The Intestines.

- a, a, a. The colon, p. 282, &c.
- b. The cæcum.
- c. A portion of the mesentery.
- d, e. Portions of the small intestines.
- f. The beginning of the colon.
- g. The rectum.

PLATE IX.

Fig. 1. Contents of the Chest

- a, a, a. The different lobes of the lungs inflated, p. 285, &c.
- b. The pericardium.
- d, d, d. The colon.
- e. The ligaments as bands of the colon.
- f, f, f. The ribs.
- g. The sternum.
- h. The diaphragm.
- i, i, i, i. The skin thrown back.
- j. One of the small intestines.
- k. The sabre-shaped cartilage.
- l, l. The neck.
- m. The situation of the trachæa.

Fig. 2. Contents of the Abdomen.

- a. Lobe of the liver.
- b. The stomach.
- c. The omentum, or caul.
- d, d. The kidneys.
- e. The spleen.
- f. The uterus, or womb.
- g, g. The ovaries.
- h. Part of the rectum.

- i, i. The diaphragm.
- k. The bladder.
- l. The gall ducts.
- m. The duodenum.
- n, n, n. The aorta.
- o. The vena cava.
- p, p. The emulgent veins, leading into the aorta.
- q, q. Leading from the vena cava.
- r, r. The spermatic arteries and veins.
- s, s. The uterus.
- t, t. Spermatic cords.

Fig. 3. Veins, Arteries, and Nerves of the Hind Leg.

- a, a, a. The femoral artery.
- b. A branch of ditto.
- c. Continuation of the femoral trunk.
- d. The anterior tibial artery.
- e, e. The femoral vein.
- f, f. The posterior tibial artery.
- g, g, g. The metatarsal artery.
- i. A branch of the femoral vein.
- j, j, j. The femoral vein.
- k, k, k. Anterior tibial veins.
- l. The metatarsal vein ascending.
- m. The large metatarsal vein.
- n, n. The inguinal artery.
- o, o, o. Nerves.
- n, n. The inguinal artery.

PLATE X.

- Fig. 1. The common gad-fly, or bot, p. 101.
- 2. The eggs as they appear upon a hair.
- 3. The same magnified.
- 4. The caterpillar, or larvæ adhering to a portion of the lining of the stomach.
- 5. The caterpillar grown to its full size.
- 6. The caterpillar of the red gad-fly, or bot.
- 7. The red gad-fly.
- 8. Visual structure of the eye, p. 205.
- A. Outer globe of eye.
- B. Inner globe of ditto.
- C, D. An arrow, showing how the rays flow from it to the retina, g. h.
- f, f. The position of the retina.
- i, i. The rays after they have passed through the cornea.
- j. The cornea.
- k, k. The crystalline lens.
- l. The sclerótica.
- m, m. The iris.
- n. The pupil.
- o, o. The ciliary, or hair-like processes.
- p. The vitreous humour.
- q. The aqueous humour.
- r. The retina.
- s. The optic nerve.
- t. The conjunctiva.
- Fig. 9. Instrument for administering medicine to horses and cattle.
- 10. The ovipositor of the ox-fly, page 524.
- 11. Tube for the passage of the eggs of do., p. 525.
- 12. Point of tubes.
- 13. Greatly magnified figure of the tail.
- 14. Magnified appearance of the tail opening.
- 15. Female gad or ox-fly.
- 16. Ordinary size of the full grown grub.
- 17. Chrysalis of the ox-fly.
- 18. Magnified figure of the grub.
- 19. The probang, used for choking in cattle, p. 471.
- 20. Cup-shaped termination of do., p. 471

PLATE XI.

Different Kinds of Shoes, &c.

1. Concave seated shoe, p. 393.
2. Under surface of do.
3. Seated shoe, p. 396.
4. Racing shoe, p. 397.
5. Hunting shoe, p. 397.
6. Patent safety shoe, p. 400.
7. Water boot, p. 400.
8. Rope boot, p. 401.
9. Horizontal view of the patent safety shoe, representing the position and inclination from the outward to the inward edge, on the foot-side of the heels.
10. Horizontal view of the same shoe taken from the toe.
11. Bottom of a water boot.
12. A speedy-cut boot.

PLATE XII.

- Fig. 1. Patten shoe.
2. Screw shoe.
 3. Frost shoe with movable roughs.
 4. Bar shoe, the foot side, showing the bar raised.
 6. Road shoe with movable toe-piece, p. 5.
 7. Plain bar shoe, the foot side.
 8. German horse-nail.
 9. English countersink horse nail.
 10. Nail with a countersink head, adapted to the concave-seated shoe.
 11. Fine head nail, suitable for the safety, or any other shoe with similar holes.
 12. Common English horse-nail.
 13. French horse nail.
 14. Improved turning hammer.
 15. Large drawing knife for paring the sole.
 16. The buttress.
 17. Drawing knife used for frog.
 18. Small searching knife for frog.
 19. Common turning hammer.

PLATE XIII.

Fig. 1. Internal Structure of the Ear of the Horse.

- a. The meatus externus, or outer passage.
- b. The membrane of the tympanum.
- c. The hammer of the ear.
- d. The anvil.
- e. The orbicular, or round bone.
- f. The stapes or stirrup bone, resting on the membrane which covers the oval tendon, and which conducts to the labyrinth of the ear.
- g. One of the muscles of the tympanum, attached to the stirrup bone.
- h. Vestibule, or hall of the ear.
- i, i, i. The semicircular canals.
- k. Openings into the canals.
- l. The tympanum or drum of the ear.
- m. The cochlea, or shell-like portion of the labyrinth.
- n. The internal passage, through which the soft portion of the seventh pair of nerves enters, and which is the auditory nerve, or nerve of hearing, and is spread over the cochlea and vestibule.
- o. The eustachian tube, or communication between the tympanum and the mouth.
- p. The cord, or nerve of the ear, which is a branch of the hard portion of the seventh pair of nerves, united to a portion of the fifth pair, running across the tympanum, and ramifying on it and on the membrane.

- q. The exit of the hard portion from the temporal bone, to spread over the face.

Fig. 2. The Occipital Bone.

- a. Point of the bone.
- b. Spine running down the centre of the bone, and a large roughened surface, for the attachment of large and powerful muscles, which turn the head in various directions, and assist in raising it when depressed.
- c. The places where these strong muscles are inserted.
- d, d. Two rounded protuberances, by which the head is connected with the atlas bone, which is the upper or first vertebra of the neck, and these protuberances are called the condyloid, or cup-shaped processes of the occipital bone. All the motions of the head are partly, and most of them wholly performed by this joint.
- e. A large hollow called the *foramen magnum*, or great aperture through which the continuation of the brain, called the spinal cord, or marrow, passes out of the skull.
- f, f. These two projections are an additional contrivance for the support of the great weight of the head; and are peculiar to those animals whose heads are set on in a slanting direction, and into which very powerful muscles are inserted. These are termed the beak-like projections of the occipital bone.

Fig. 3. The Cells of the Cæcum or Blind Gut.

Fig. 4. The Compound Stomach of a ruminating animal, viz., the ox, sheep, &c., or those animals which chew the cud.

- a, b. Two probes to indicate the course of the food before and after rumination.
- d. The paunch, which is of a large size, and occupies a large portion of the belly. It is in this that the food is received when first swallowed.
- c. The second stomach: its inner surface is covered with numerous pentagonal cells.
- e. The *psalterium*, or third stomach.
- f. The *abomasus*, or fourth stomach.
- g. The pylorus, where the fourth stomach terminates.

PLATE XIV.

Head of a Sheep, exhibiting the Bleeding Vein, &c.

Fig. 1. See p. 586.

- a. The vein which proceeds from below the under jaw, at b, and its branches spread on the soft part of the cheek, from this point.
- c. A small nerve runs in an opposite direction from this point and crosses over the vein.
- d. A thin muscle beneath which the vein passes.

- Figs. 2, 3, 4, 5, 6, and 7, exhibiting the teeth of the sheep from one to six years old.
8. A worm called pentastoma found in the frontal sinus of a sheep, p. 563.
 9. The head magnified.
 10. A cross section, showing the intestines.
 11. The point of the tail magnified.

PLATE XV.

Artificial Flies used in Angling, &c.

- Fig. 1. Camlet-fly.
 2. May-fly.
 3. Green-drake.
 4. Hawthorn.
 5. Palmer.
 6. Ant.
 7. Dun-cut.
 8. Red-brown.
 9. Moth.
 10. Red-palmer.
 11. Salmon-fly: hook No. 3.
 12. Spring-fly for ditto: hook No. 1.
 13. Rough-coat.
 14. Green-drake.
 15. Cadis in case.
 16. Rough-coat-fly.
 17. Minnow tackle.
 18. Rough-coat, surrounded by small shells.
 19. Cadis out of case.

PLATE XVI.

- Fig. 1. Gorge-hook, baited.
 2. Beed-hook.
 3. Hook with live bait.
 4. Snap-hook.
 5. Snap-hook, sprung
 6. Snap-hook, baited
 7. Common line-snap, baited.
 8. Common line-snap

9. Dead-snap, with three hooks.
 10. Beed-hook.
 11. Dead-snap, baited.

PLATE XVII

- Fig. 1. Dead-snap with four hooks, baited
 2. Dead-snap with four hooks.
 3. Common dead-snap.
 4. Common dead-snap, baited.
 5. The common trimmer.
 6, 7. The common trimmer, baited.
 8. A trimmer for weedy waters.
 9, 10. Ditto, baited.
 11. The baiting-needle.

PLATE XVIII.

- 1, 1 Cinnamon-fly, August.
 2. Dead-snap with two hooks.
 3, 3. Willow-fly, September.
 4. Stickleback with one hook.
 5. Ditto with two hooks.
 6, 6. Peacock-fly, March.
 7, 7. Dun drake-fly, March.
 8, 8. Alder-fly, May.
 9, 9. Great red spinner-fly, March.
 10, 10. Green drake-fly, June.
 11, 11. Sand-fly, April.
 12, 12. Red-fly, March.
 13, 13. Dark mackerel-fly, June.
 14, 14. Iron blue dun-fly, April.
 15, 15. Gold-eyed gauze-fly, July



THE HORSE

LONDON: GEORGE VINTAGE





BONES OF THE SKELETON OF A HORSE.



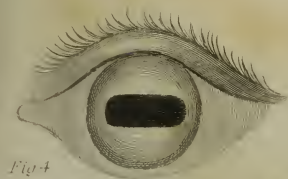


Fig. 4



Fig. 1.

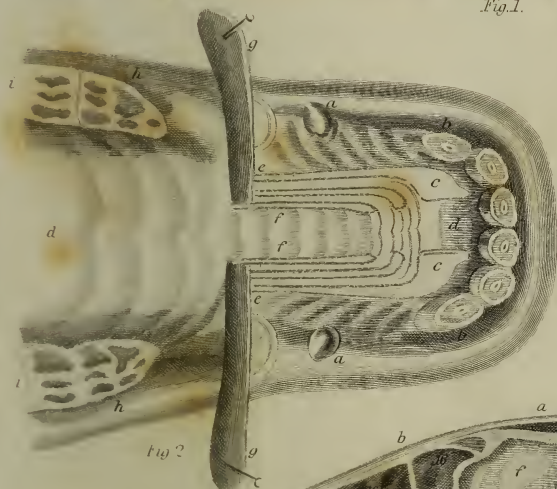


Fig. 2

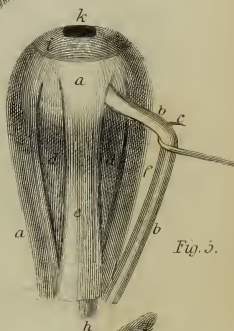


Fig. 5.

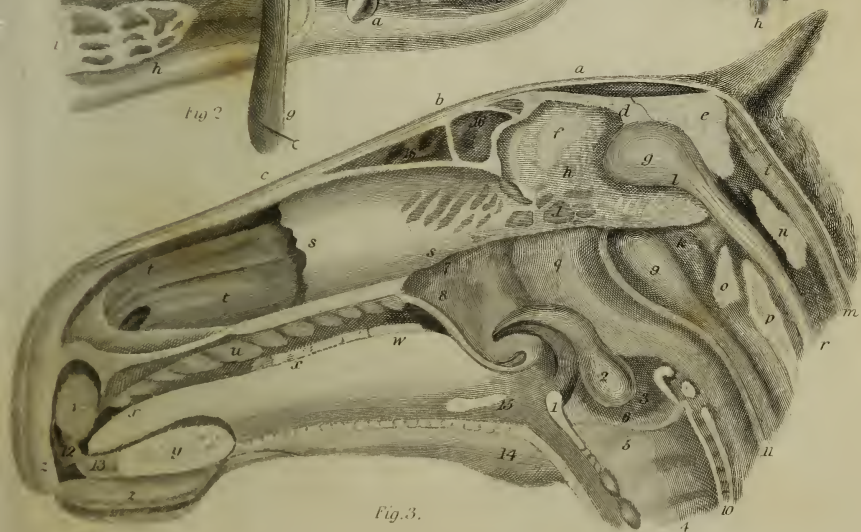


Fig. 3.

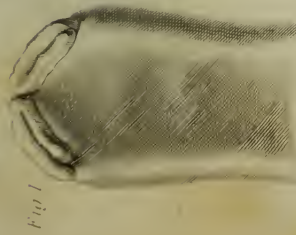


Fig. 1

1 MONTH



Fig. 3

12 MONTHS

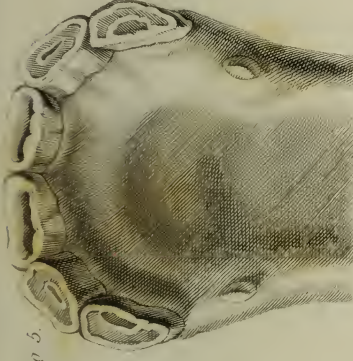


Fig. 5

2 YEARS

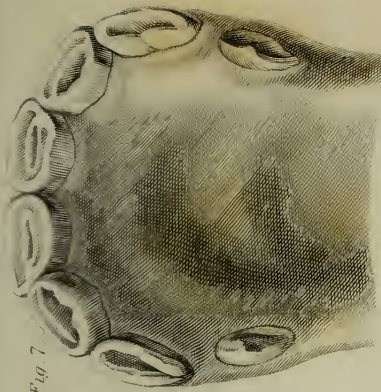


Fig. 7

5 YEARS

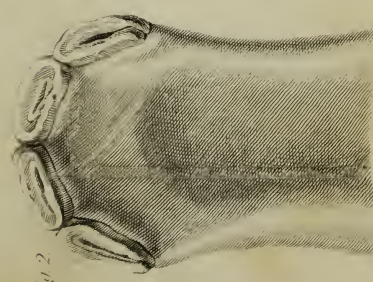


Fig. 2

6 OR 7 MONTHS

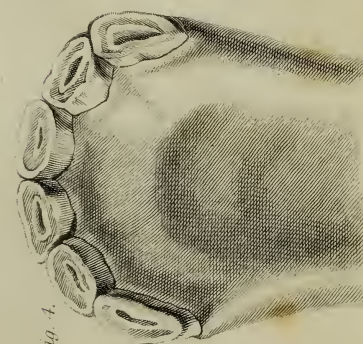


Fig. 4

2 YEARS

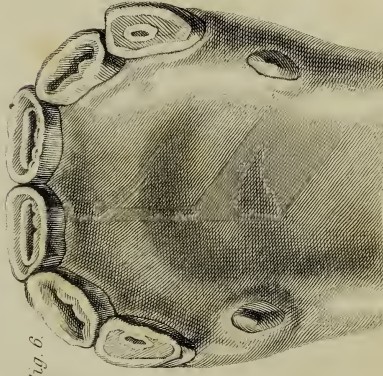


Fig. 6

4 YEARS

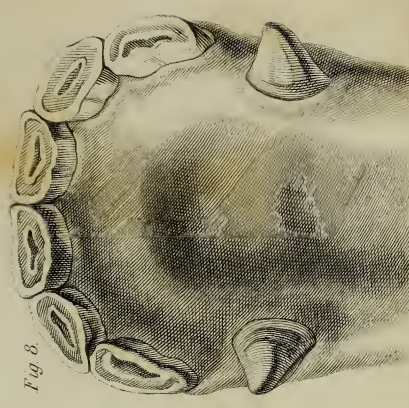


Fig. 8

6 YEARS

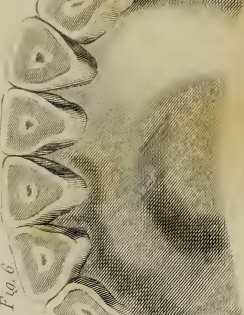
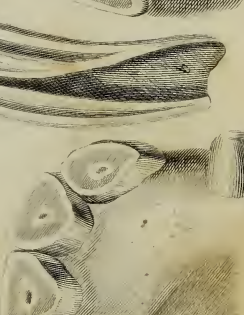
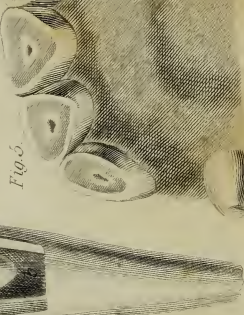
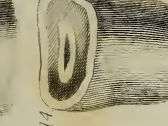
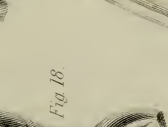
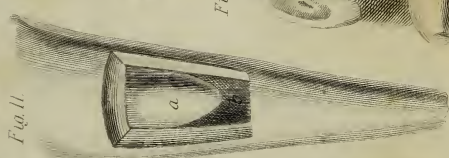
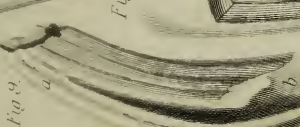
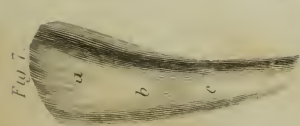
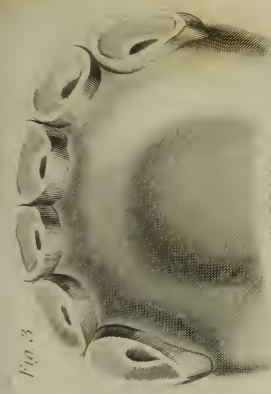
TEETH OF THE HORSE FROM A WEEK TO SIX YEARS

LONDON: GEORGE VIRTUE

Drawn by T. Brown



Upper



1 YEAR

1 YEAR

1 YEAR

PLATE OF THE MOUTH FROM SEVEN TO EIGHT YEARS











Fig. 1.

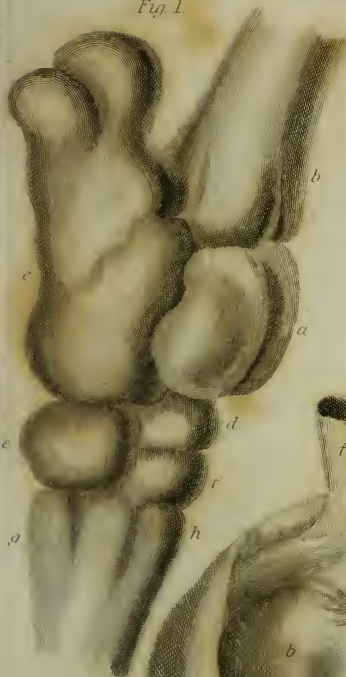


Fig. 2.

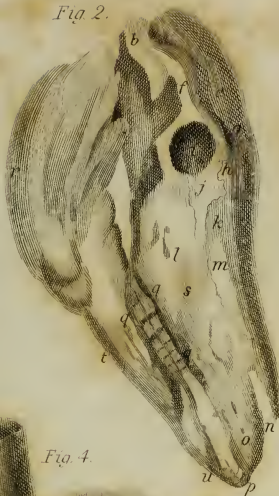


Fig. 3.



Fig. 4.

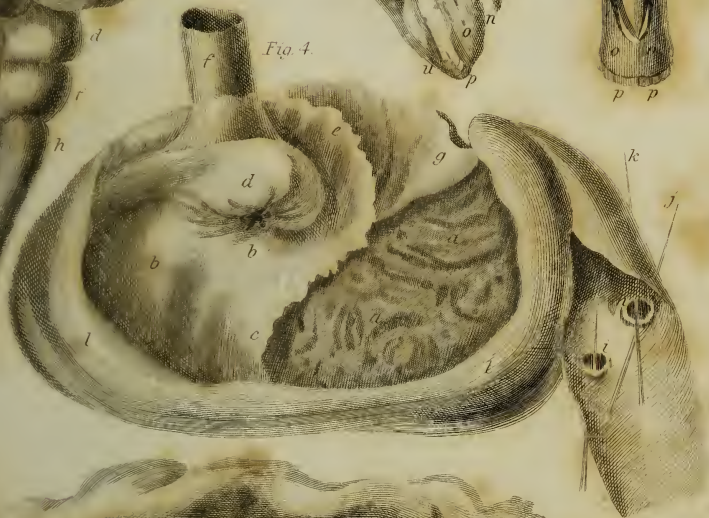


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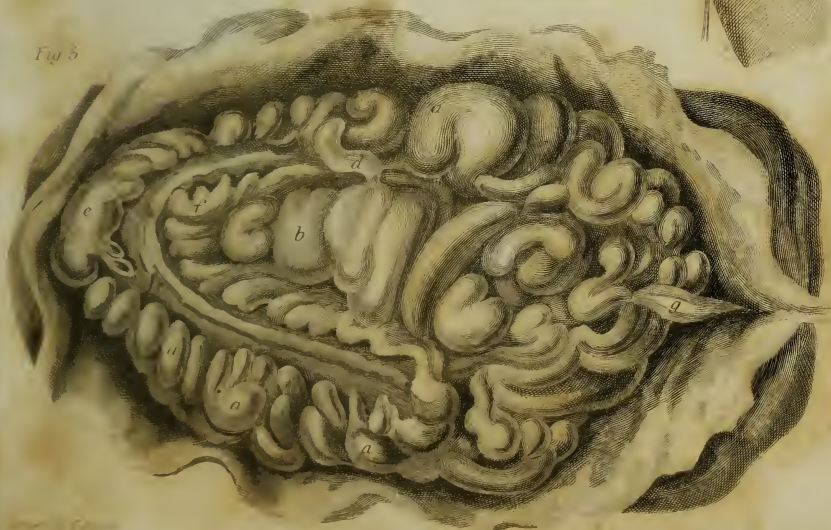


FIGURE OF THE STOMACH, 4, THE STOMACH, 5, THE INTESTINES



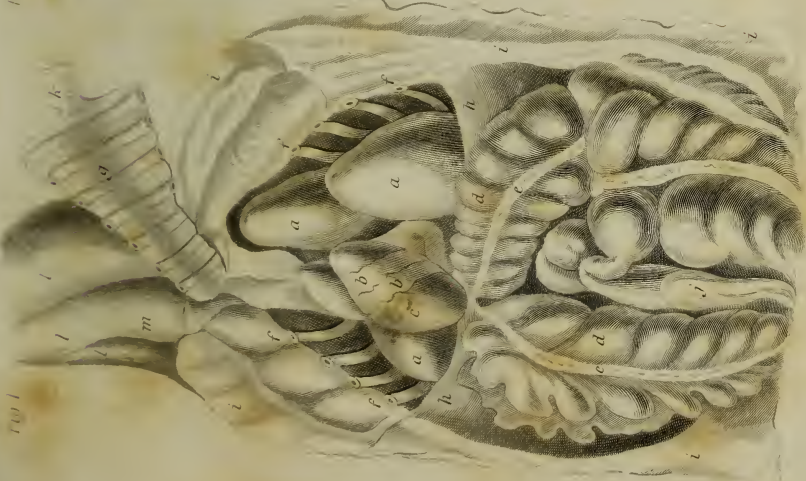
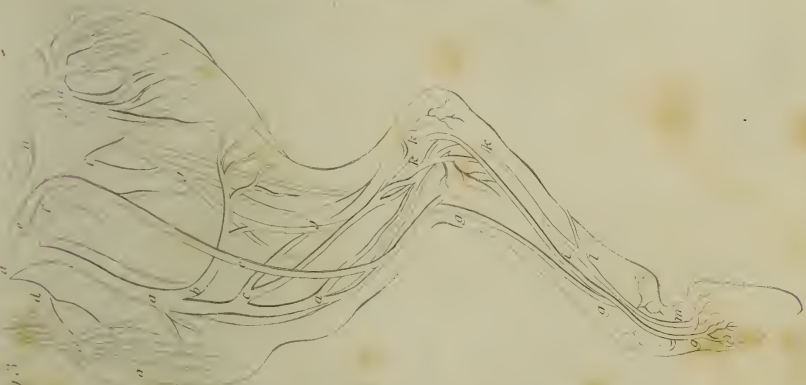


Fig. 2

Fig. 3

Fig. 4



Fig 20.



Fig 2.

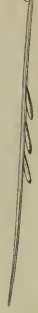


Fig 3.



Fig 4.

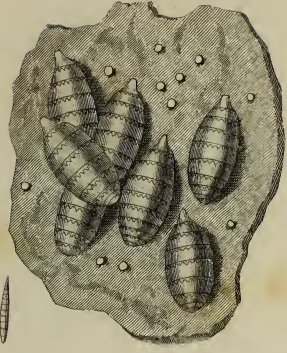


Fig 9.



Fig 6.



Fig 7.



Fig 1.



Fig 5.



Fig 8.

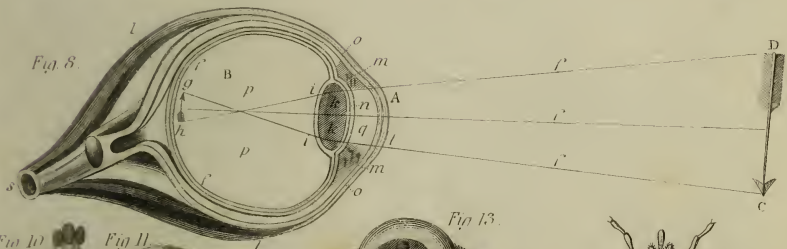


Fig 10.



Fig 11.



Fig 12.



Fig 13.

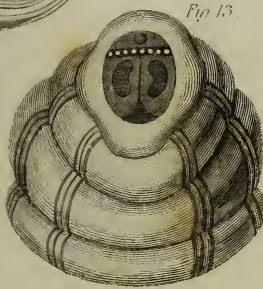


Fig 14.

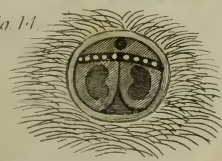


Fig 17.



Fig 18.

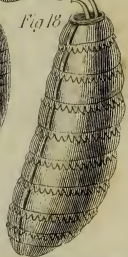


Fig 16.

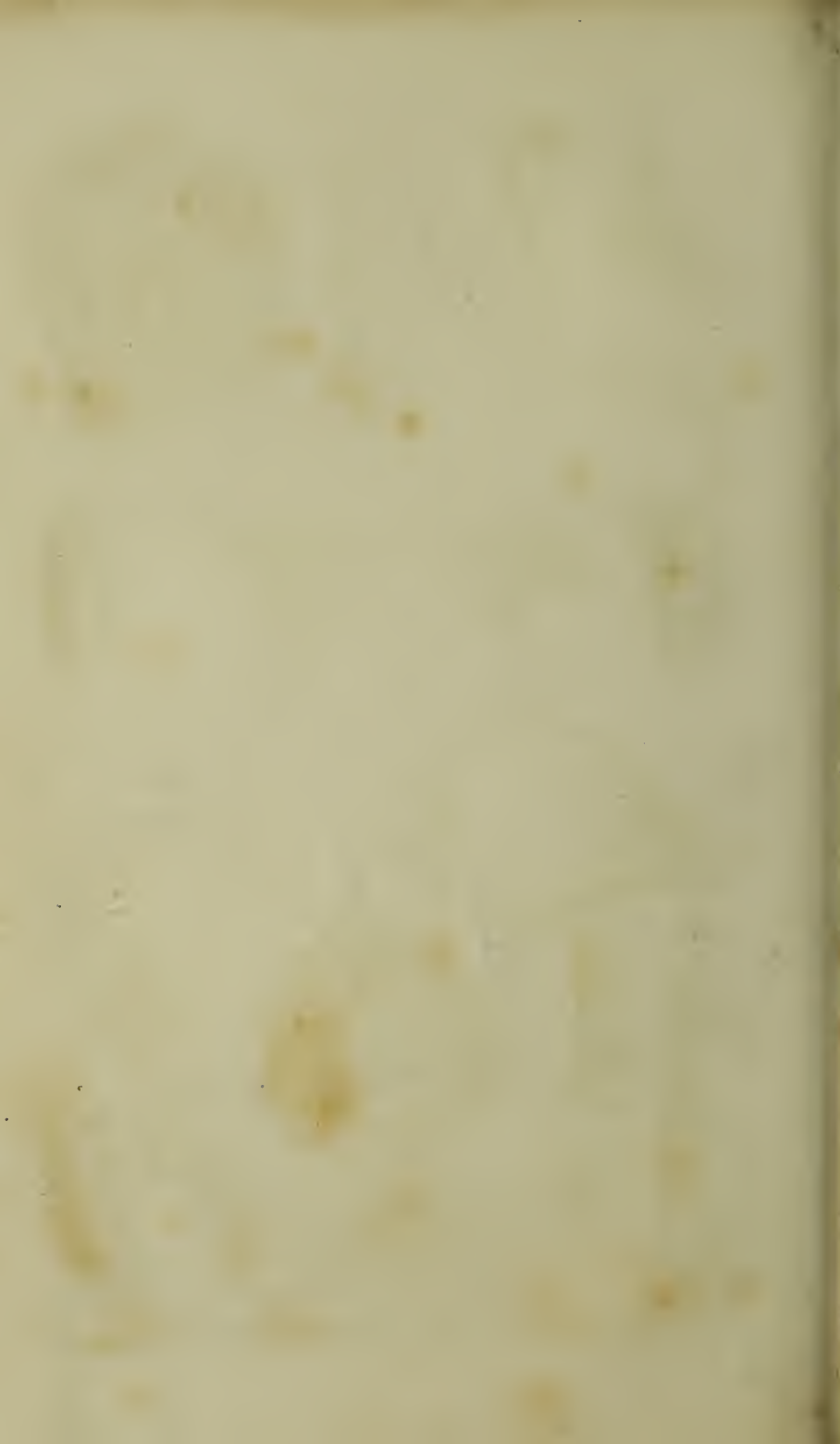


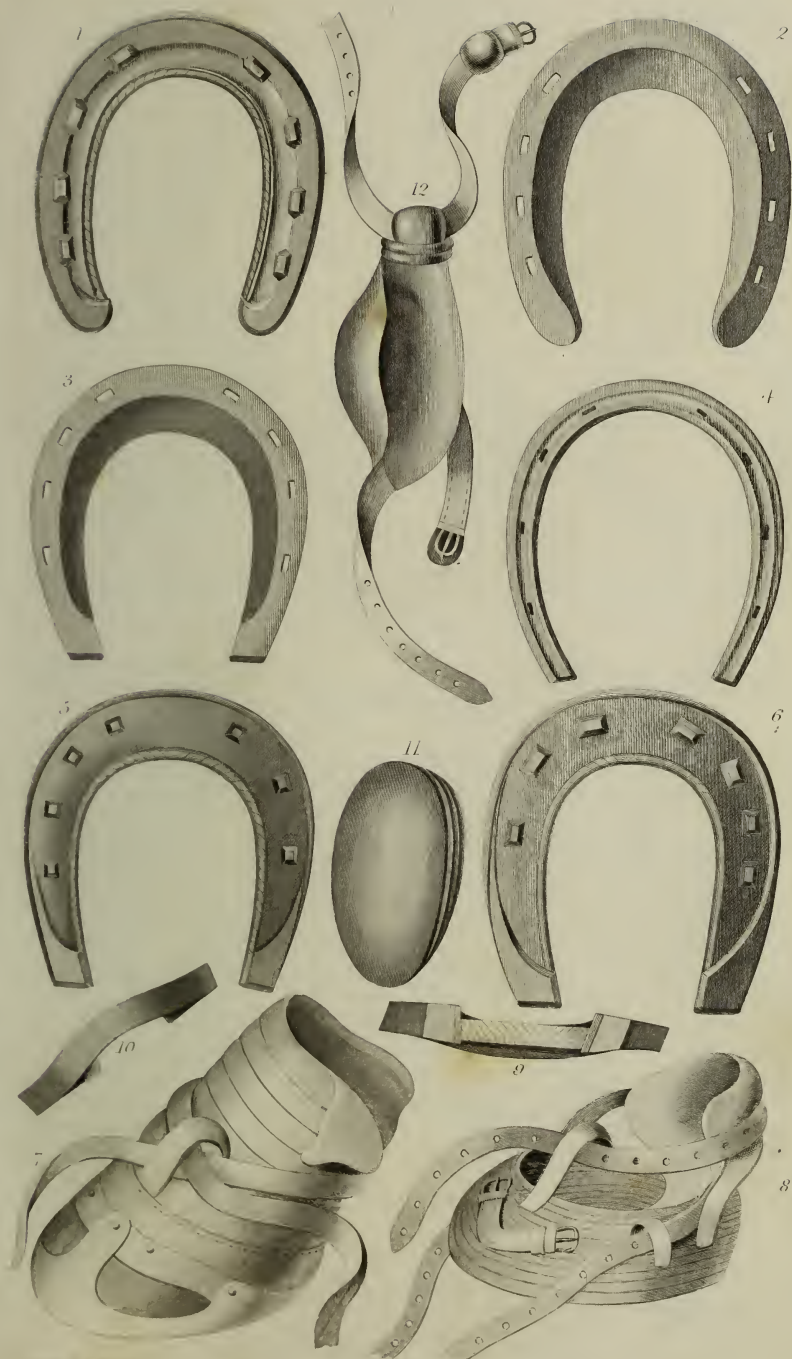
Fig 15.

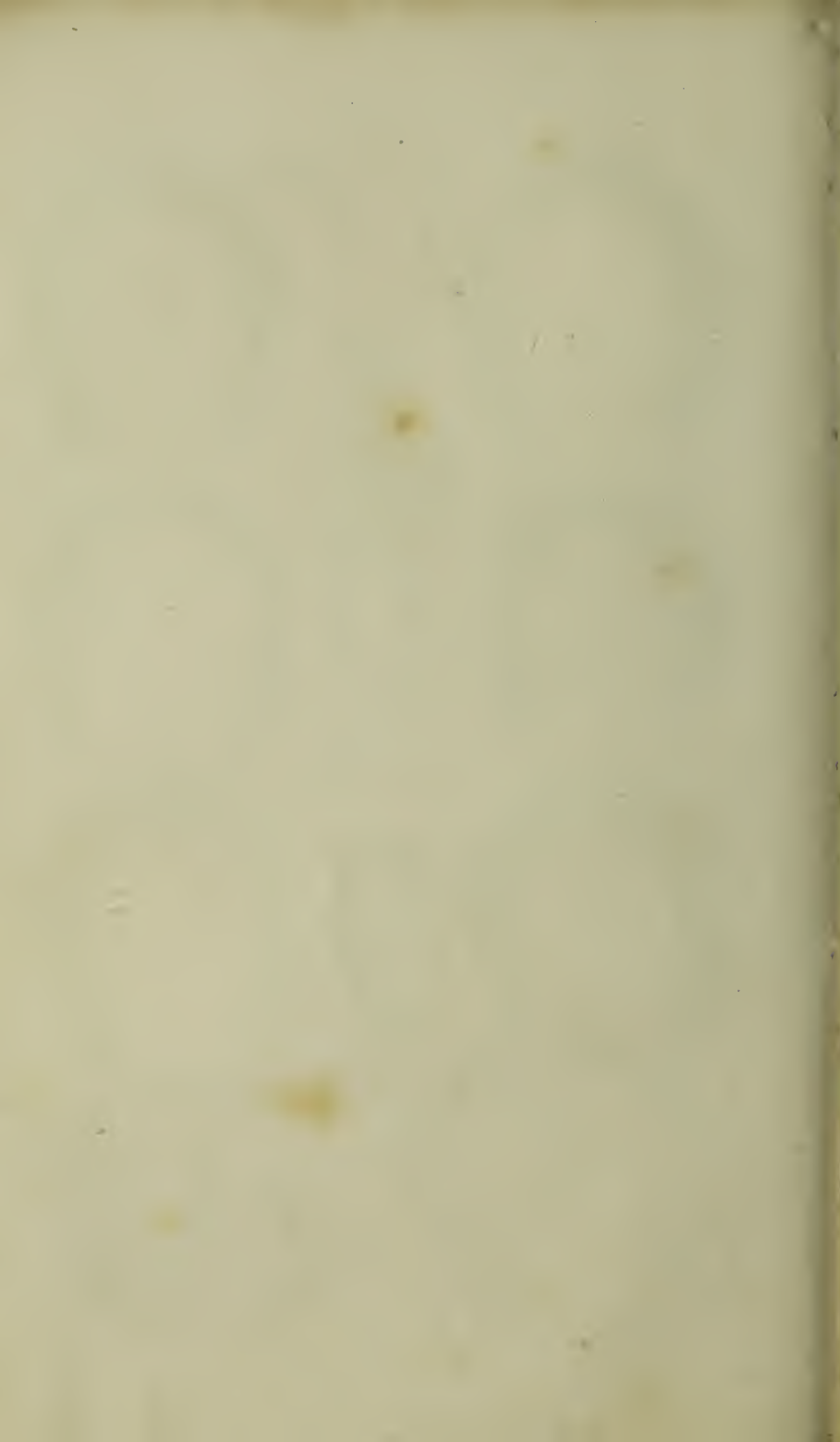


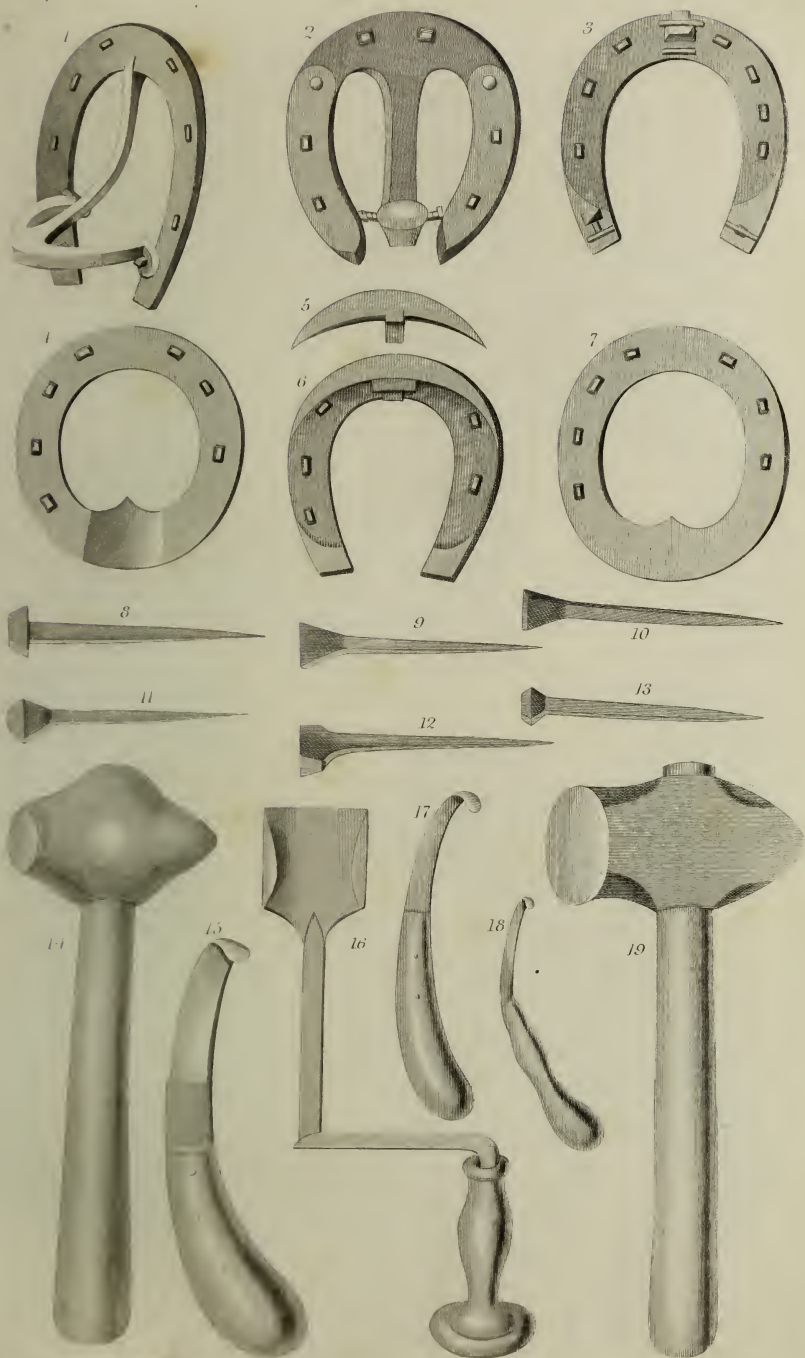
Fig 19.

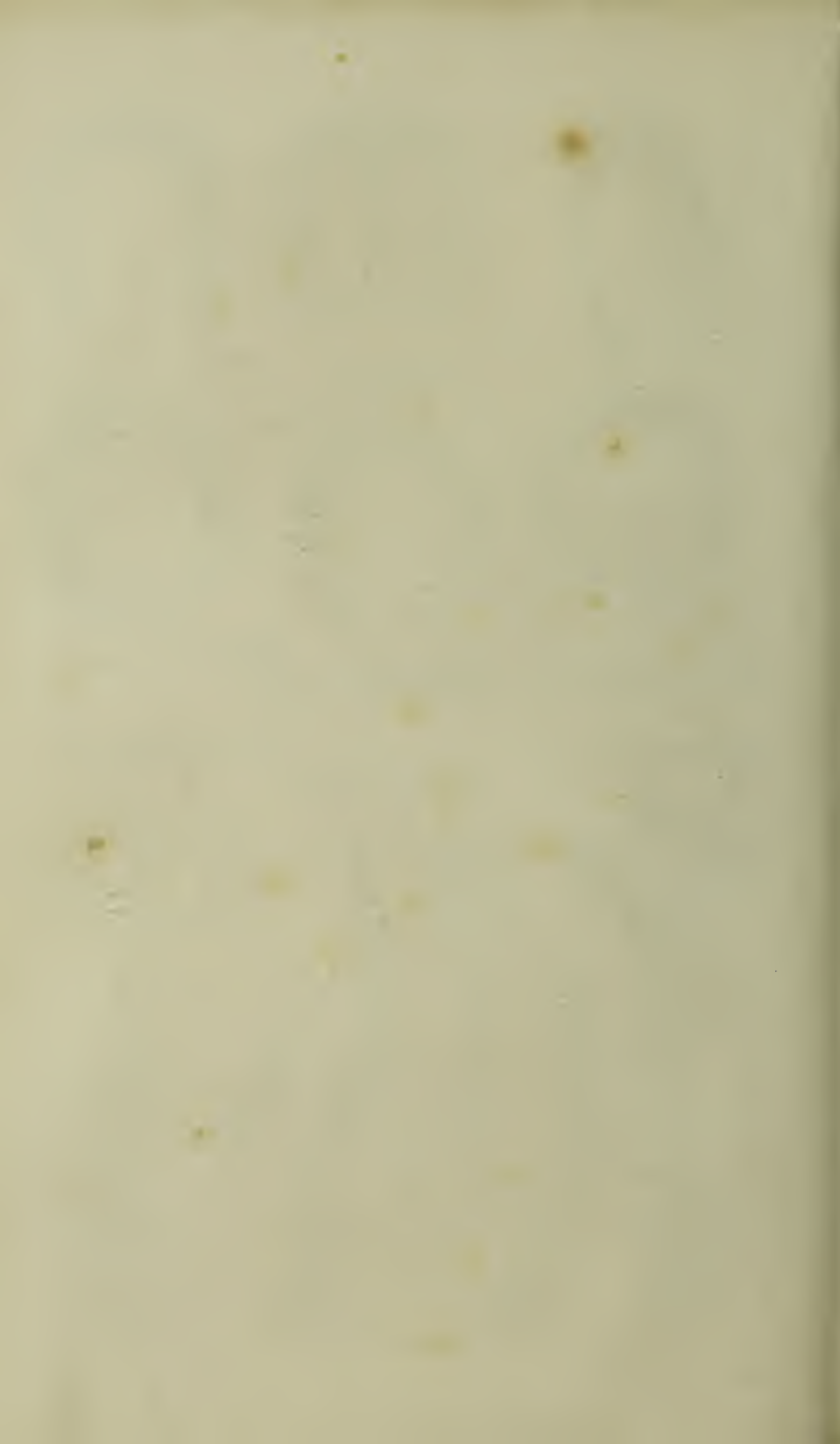


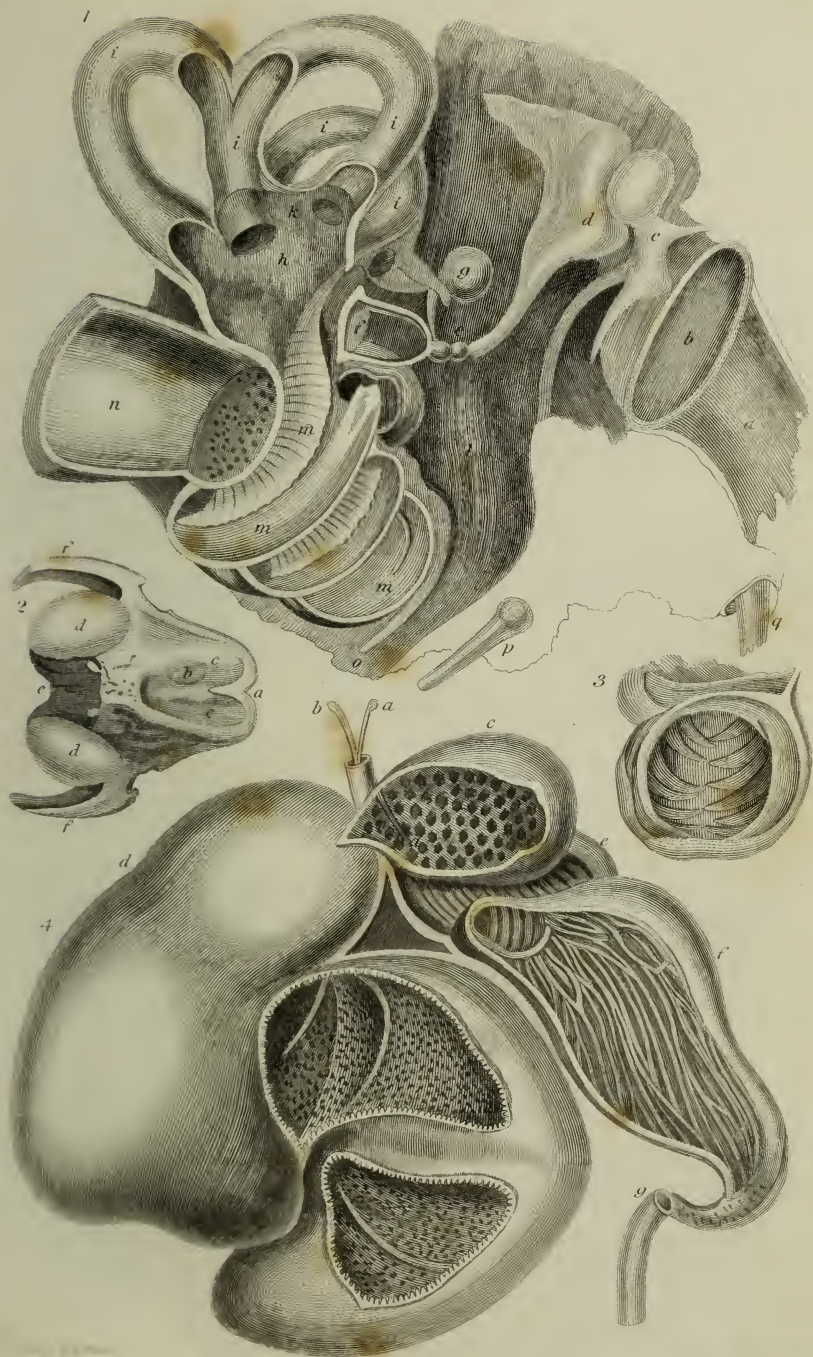








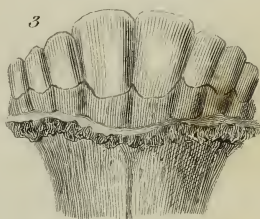








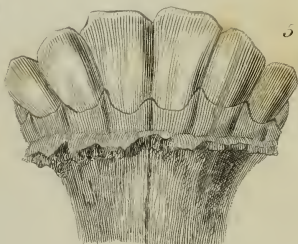
1 YEAR.



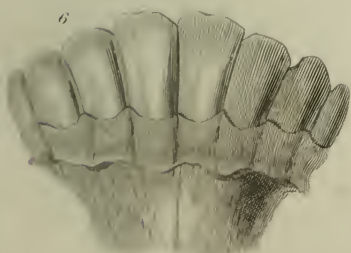
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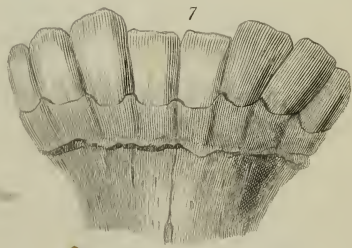
3 YEARS.



4 YEARS.

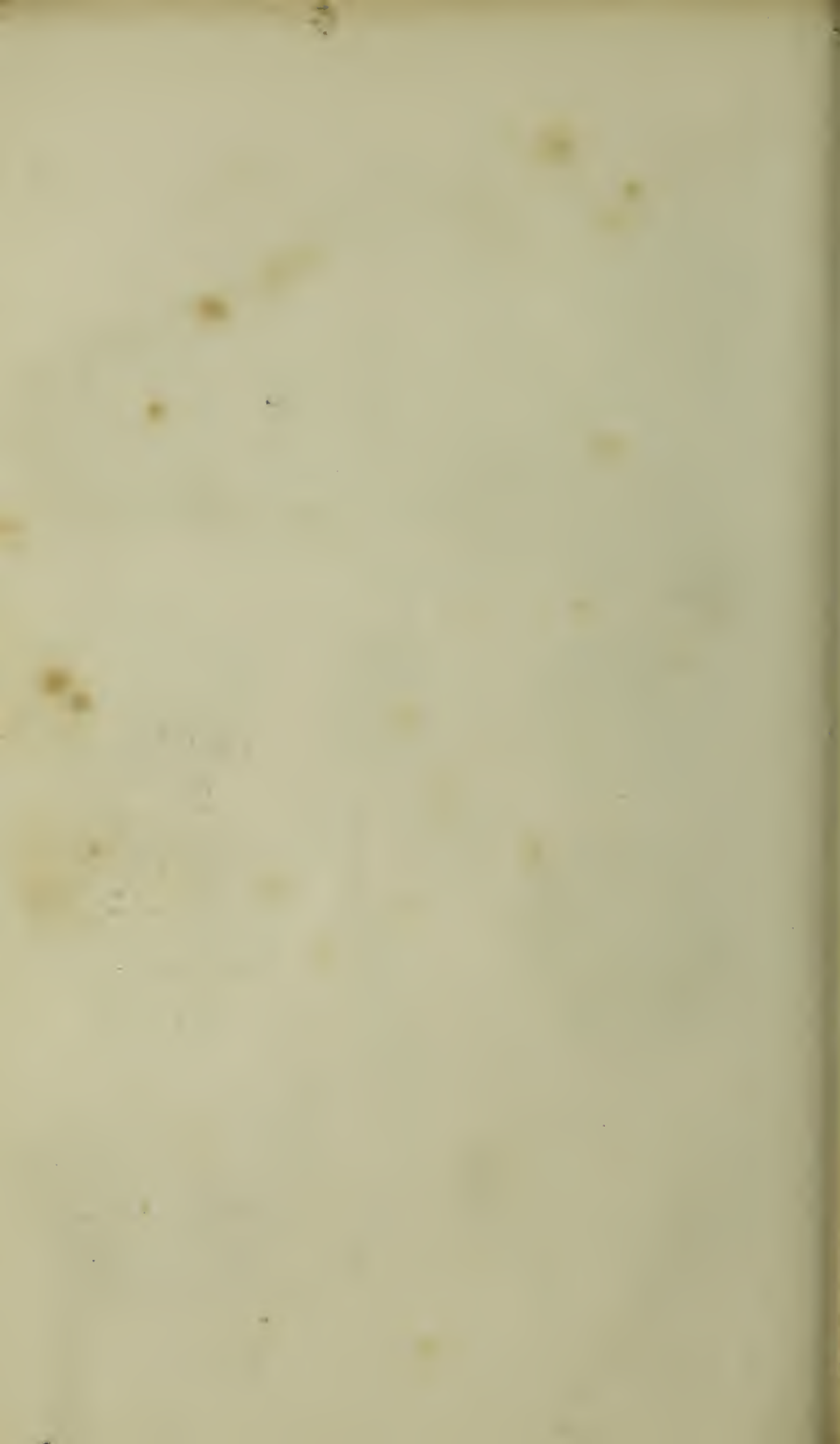


5 YEARS.

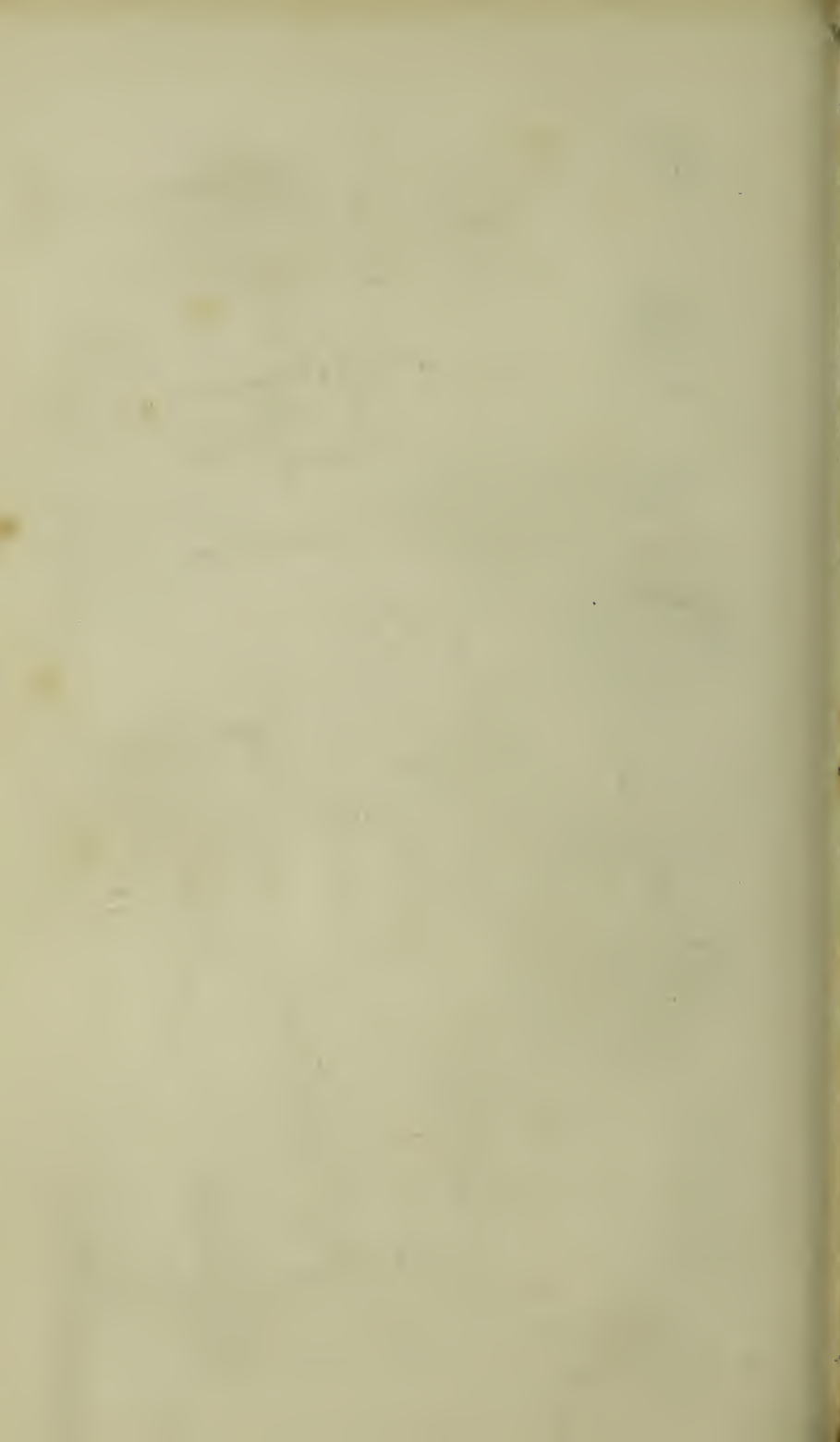


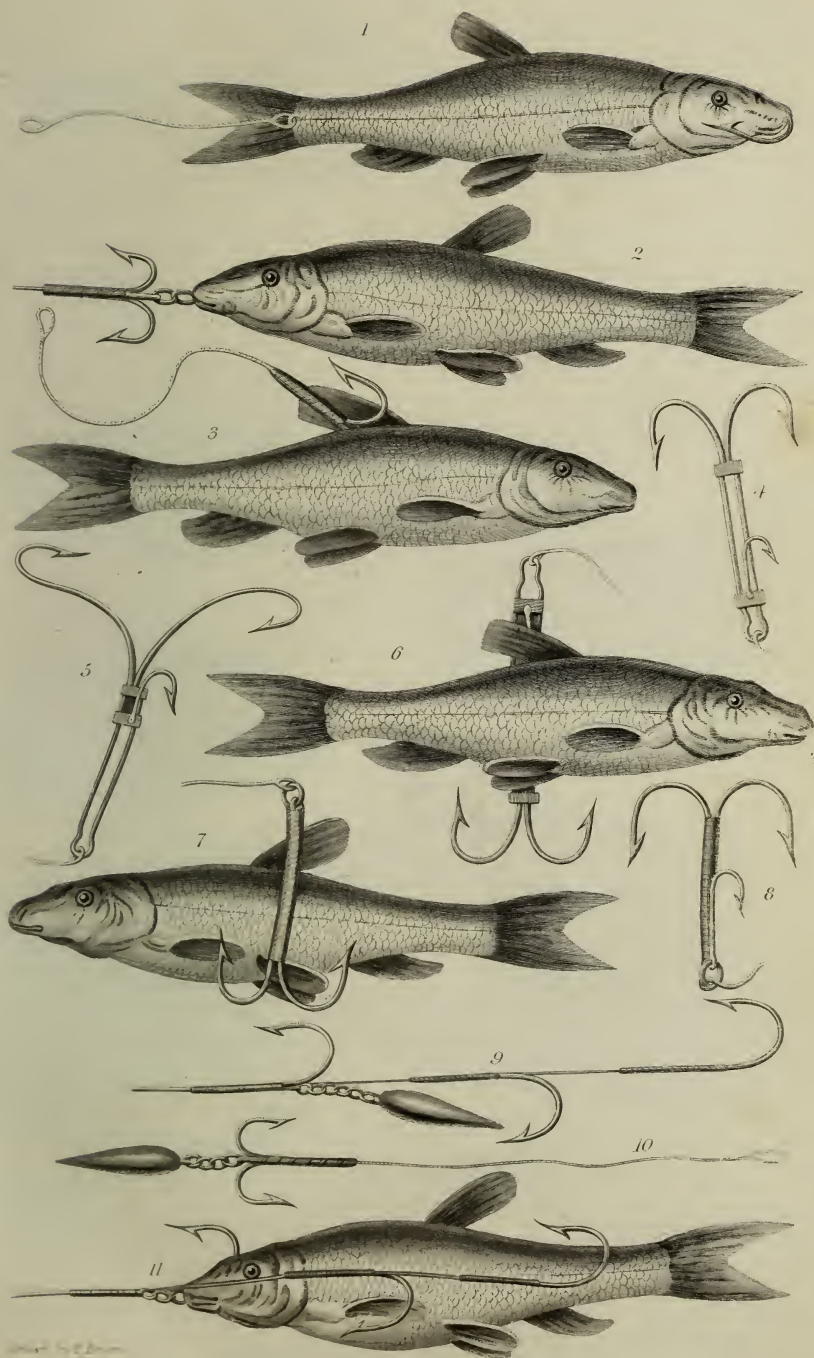
6 YEARS.

HEAD OF A RABBIT SHOWING THE ARRANGEMENT OF THE TEETH FROM ONE TO SIX YEARS

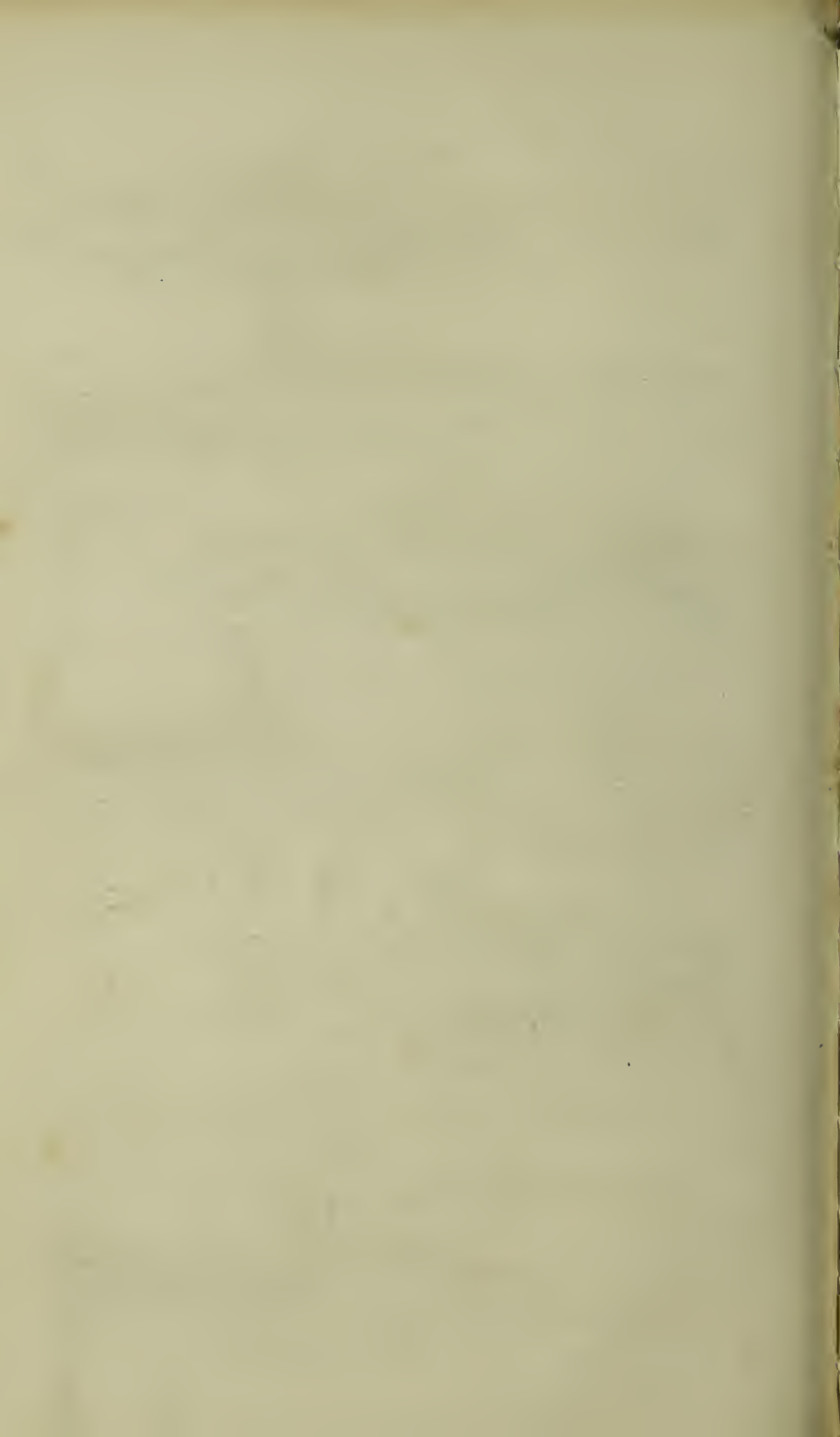




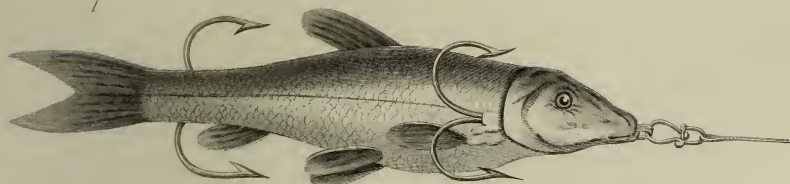




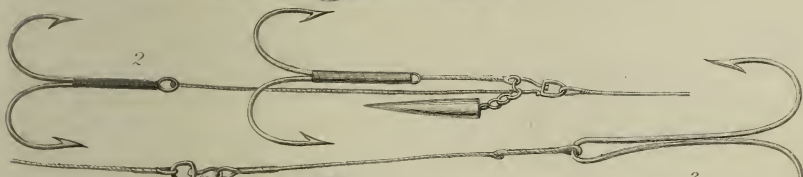
DIFFERENT KINDS OF FORTH AND SEAL BOOKS, &c.



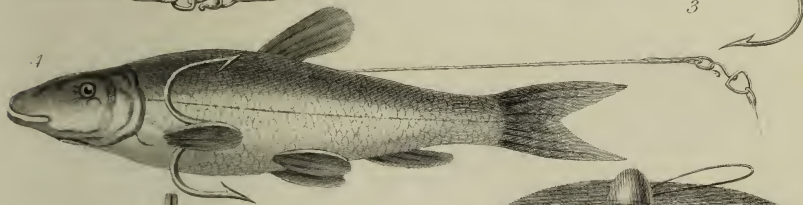
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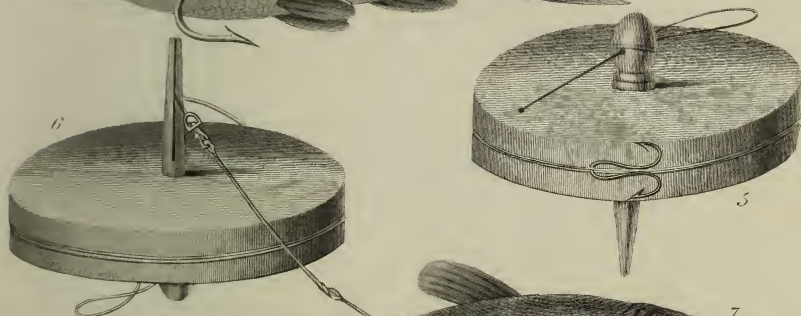
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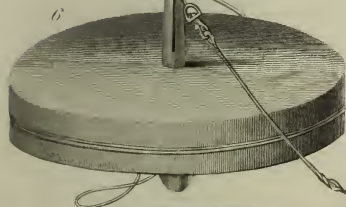
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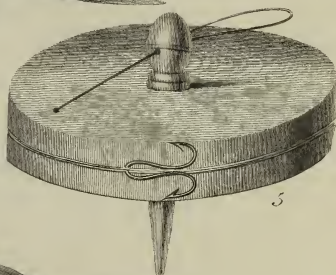
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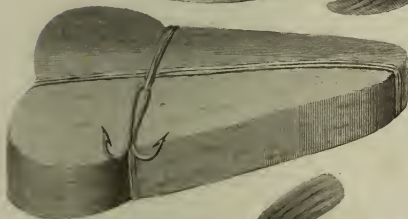
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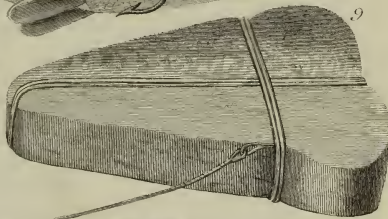
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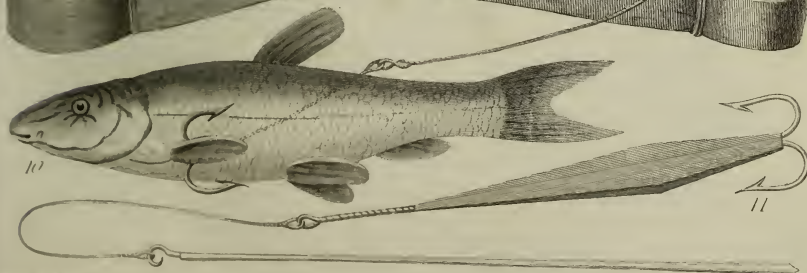
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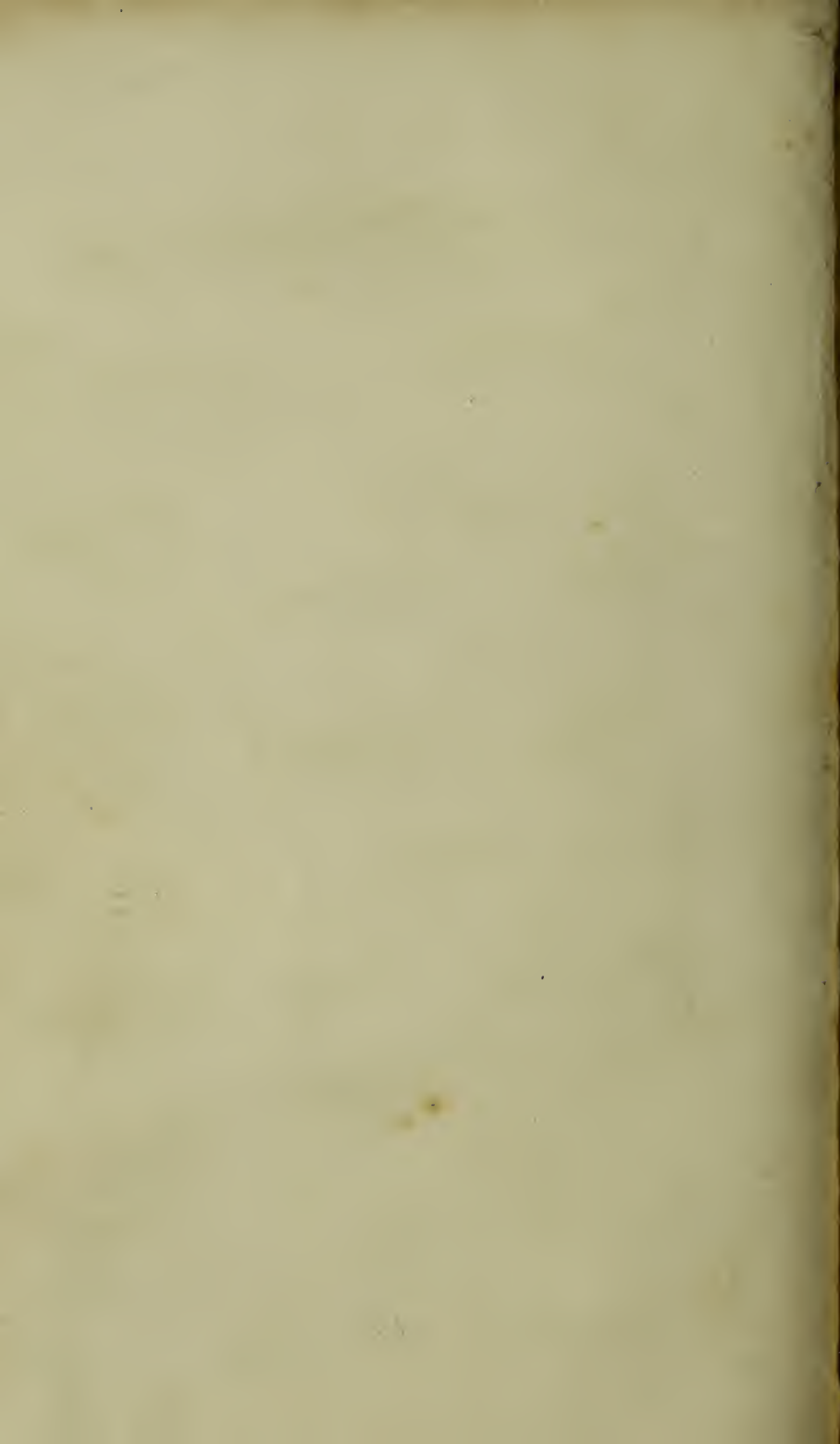


10



11





MANUAL OF MODERN FARRIERY.

INTRODUCTION.

THE term Farriery has been in use for a very long period, and embraced the Medical and Surgical treatment of the Horse, as well as Shoeing, and fitting him for taking the road and the field.

The persons employed in the manual labour of constructing and fitting the shoes of horses were originally termed *Ferrers*, or Ferriers, from the Latin word *ferrum*, iron, and their practice *ferriery*, which has, in the course of time, been changed into the word Farrier, and now universally adopted.

In most country situations the blacksmith who shoes horses is called the farrier, because he is generally the only person, in many localities, who practises the art of horse and cattle doctor. Not only is this the case in Great Britain, but also in every country of Europe.

It is to be lamented that more attention is not devoted to the useful practice of the cure of domestic animals, more especially when we consider not only their great value, but also their commercial importance. As well may the medical care of man be intrusted to shoemakers and tailors, as the care of horses, cattle, swine, dogs, and other domestic animals, be left

to the tender mercies of an untutored blacksmith, who although by practice he may be extremely competent to shoe or bleed a horse, is, nevertheless, most unlikely to be able to administer relief to animals whose physical constitutions are subject to as many and complicated diseases, as humanity itself.

In France and Italy the importance of the cure of the diseases of horses and cattle was first manifested upwards of two centuries ago ; and professorships established for the art of farriery, as a medical and surgical science, and gradually the persons who professionally studied and practised this art assumed the names of Veterinary Surgeons. This term, although but recently adopted, is of great antiquity, having been in general use among the Latins.

It is, however, surprising that in Great Britain, where our domestic animals are of such vast importance, it is only very lately that schools and professorships for the study of the Veterinary art have been established ; and not half a century ago, the surgeons of our cavalry regiments administered medicine to horses as well as to the soldiers. But the study of Comparative Anatomy soon rendered it manifest that a totally different course of study became nec essar for the treatment of animals whose internal organization was so different from that of the human being ; and now every horse regiment has its Veterinary Surgeon. All great towns, and many small ones also, possess medical and surgical practitioners, whose sole attention is devoted to the cure of domestic animals ; these gentlemen having attended and acquired diplomas from the Veterinary Colleges for their knowledge and capability to practise the arts.

The intention of the following treatise is not to take the practice out of the hands of regular Veterinary Surgeons, but to serve as a ready manual to those living in the country, or even in towns, to give them a general idea of the diseases

and remedies, so that they may be applied in time of need, and where a regular veterinary practitioner is not at hand.

Some of the diseases incidental to horses and cattle are so marked in their character, that a little experience will easily enable a person accustomed to be among those animals, to detect it with facility, and in such cases, medicine may be safely administered, according to the rules we have laid down ; but there are other disorders, whose characters are of a more complicated form, which ought not to be treated by a person uneducated in the veterinary art. In such cases it will always be found safer and cheaper in the end to apply to regular practitioners.

Although in a certain sense there is some analogy between the diseases of man and animals, yet these are exceedingly different in their specific characters, and consequently in the remedies applied for their cures ; the construction of the stomach, the length of the alimentary canal and small intestines, with other organic distinctions—all combining to render the specific quantity and character of the medicines to differ essentially.

Nevertheless, it is quite possible to acquire a thorough knowledge of all that is known in the veterinary art, by persons in private life ; although considerable study, as may well be supposed, is necessary to attain this degree of knowledge.

The first thing to be studied is to acquire a knowledge of the skeleton, then of the muscles, and lastly of the internal organization. The two first of these are pretty much alike in all our domestic animals, but a very great difference will be found in the internal structure. For the skeleton and muscles, works and good engravings will give a good idea to the beginner ; and after acquiring the names of the different bones and muscles, the student must practise upon dead

subjects, so that he may be enabled, by dissection, at once to determine what part of the body is affected by lameness or a wound. He must next acquire a thorough knowledge of the exact situation of the internal organs, and their comparative dimensions and structure. Attention must next be given to Chemistry, and the compounding of medicines, with the relative quantities to be administered to the different animals, which will depend upon, as above hinted at, the structure of the stomach and the length of the large and small intestines. Upon the character also of the nervous system will depend much of the treatment of animals, and the energy and immediate application of remedial means. Some diseases are slow in their progress, while others are so rapid that there is more art and utility in arresting them, than in a cure after they are fairly formed. But this can only be acquired by experience.

It is not pretended that the knowledge above specified is to be found within the limits of this work, which is chiefly intended as a popular digest of all that is truly useful to the country gentleman and practical farmer, and others possessing domestic animals. We shall, however, in the course of the work, give illustrations of the general structure of the Horse, with such other parts as should be generally known, and directions concerning their functions ; so that the classes for whom it is intended may have such a knowledge of the subject, as will enable them to act for themselves, in ordinary cases, and in others to qualify them for detecting the impositions too frequently practised by ignorant quacks.

S E C T I O N I.

OF THE HORSE, ITS DISEASES AND STRUCTURE.

C H A P T E R I.

DISEASES OF THE HEAD, INCLUDING THE BRAIN, EARS, MOUTH, NOSTRILS, EYES, &c.

THE diseases of the head in animals, as well as in the human being, are, for the most part, so complicated and obscure that few non-professional men are qualified to undertake their cure with success; but it will be our endeavour to treat the subject in as plain language as possible, so that those who have not regularly studied the veterinary art may at least acquire such a knowledge as will enable them to apply some judicious remedy, until the advice of a practitioner can be obtained.

MEGRIMS.

This malady is occasioned by a pressure on the brain, caused by an unusual flow of blood to it. The flow of blood through the brain is ten times greater in quantity than through any other portion of the body of equal bulk. To prevent as far as possible any unusual flow of blood to this organ, the arteries pursue an extremely winding and circuitous course, and enter the skull through small holes in the bony process. These holes are so small that they will

admit but of little enlargement of the blood-vessels, and thus to a great extent the progress of inflammation is arrested. Yet, notwithstanding this beautiful provision in nature, the horse is liable to be afflicted with diseases in the brain, from violent and injudicious exercise, and hard driving or riding in warm weather, which forces the blood to the head, and distends the arteries of the brain more than the veins; and the consequence is, the small vessels which ramify the substance of the brain get gorged with blood, and then its bulk is increased to such an extent that it will produce undue pressure upon the organ of the nerves, which is followed by loss of power and even consciousness, and consequences of a very serious nature frequently follow. The same effects are also produced by the curb-rein being too tight, or from the collar being too small.

SYMPTOMS.—The MEGRIMS is the name of the simplest form of inflammation, arising from the above causes. This most commonly appears when a horse is over-driven. When attacked, he will suddenly stop and shake his head, having been seized with giddiness and a slight degree of unconsciousness. If allowed to stand for a few minutes, this will go off, and he will be enabled to proceed on his journey. But it not unfrequently happens that the attack is of a more severe kind; and under such circumstances the horse will fall suddenly, or in other cases will run round several times and then fall. Sometimes he will lie quietly in a state of complete torpor; at other times he will struggle with great violence, and yet be unable to rise. In either of these conditions he will continue for from five to ten minutes, when he will gradually resume sensibility, and then will be able to get on his feet, and may then proceed on the journey. But after these attacks he generally exhibits symptoms of dulness and exhaustion.

REMEDY.—Immediately after the first attack of this disease, recourse should be had to bleeding. Three or four quarts of blood from the neck generally have the effect of arresting the symptoms. Another method is to cut the palate, which will permit a sufficient flow of blood to have the desired effect, that is, from two to three quarts. This, of course, should only be resorted to if the driver happens not to possess a lancet at the time the horse is attacked.

The bleeding place of the palate is in a direct line between the middle and second cutting teeth, and situate a little more than an inch within the mouth. Here the vein and artery make a curve. A sharp penknife may be used, and cut down upon the spot where they intersect each other. The result will be a plentiful flow of blood, and which will stop of its own accord when two or three quarts have issued forth. In consequence of the artery being cut across, it will shrink and speedily cease to bleed, and the application of a sponge, or piece of rag and cold water, will stop the bleeding of the vein. In this operation the nerve is generally divided, but no bad effects will result from it.

If the cut is made a little too much on one side, and nearly opposite the second incisor tooth, it is possible the artery may be wounded longitudinally, but not divided, in which case there may be great difficulty in arresting the flow of blood. The most effectual method is to make a large and compact pledget of lint or tow, which should be rolled round a piece of twine, and then firmly tied round the front teeth, and its pressure on the surface of the bleeding part will generally stop it; but should this prove ineffectual, then a gag may be constructed so as to press upon the pledget, which is sure to stop the bleeding.

It is only when a horse is on a journey that the above mode of bleeding, by cutting the bars of the palate, is to be

resorted to, because there is no way of ascertaining the measure of the blood, nor can the degree of inflammation be satisfactorily investigated. Therefore it is only in cases of necessity that it is to be applied, as it may not only occasion much pain to the horse, but also a great deal of trouble to the operator. The ordinary mode of blood-letting is preferable in all cases. Immediately after the first attack, three or four quarts of blood should be taken from the vein of the neck. A short time afterwards, give a dose of physic, in the form of a ball, consisting of the following ingredients :—

Barbadoes aloes	.	.	1 ounce,
Ginger	.	.	2 drachms,
Calomel	.	.	2 drachms ;

to be beat up in a mortar with a sufficient quantity of honey, so as to form them into a ball, which must be administered in the manner we direct under the head of “Medicines.”

The Megrimis is a very dangerous disease, not only to the horse but also the driver, as in many instances the horse will die instantaneously, and frequently drop without the slightest previous indication of illness. If a horse has had one attack of this malady, he is liable to a return of it ; and after a second attack, although proper means have been adopted to prevent a recurrence of it, the most prudent plan is to part with the animal, as he can never afterwards be depended upon.

THE STAGGERS, OR APOPLEXY.

SYMPTOMS.—The premonitory appearances are a low hanging of the head, and either supporting it on the manger, or extending it nearly to the ground. He moves to and fro while standing, and seems liable to fall at every movement. His sight and hearing are much impaired. He will remain

in this condition from one to twelve hours ; he then falls. His eyes are open and protruding, with a fixed, seemingly unconscious, stare, with the pupils much dilated ; he grinds his teeth, the whole frame manifests twitchings, the vein of the neck is inflated, his muzzle is cold, and in attempting to swallow, the drink is returned by the nostrils and mouth, and he dungs involuntarily : strong convulsive twitchings follow, and these are the certain preludes to death.

In the first stages of the disease it comes on progressively, with depression, sleepiness, and feebleness, which is distinctly indicated by dulness of the eye. As it increases, he presses his head against the wall or the rack, and when aroused from this position he seems alarmed.

CAUSES.—A deranged state of the digestive organs is the most ordinary cause, and this is the effect of over-feeding in many cases. Some persons are so foolish as to suppose that horses may have as much grain as they can eat, and that it will do them no harm. This is a serious mistake ; because, even without the aid of water, the grain will swell in the stomach, and from being completely overloaded, indigestion follows, the stomach being too much distended to be able to perform its office. Hence the head is affected ; as in the animal economy a very intimate connexion exists between the brain and stomach, each reciprocally influencing the other. The want of air and exercise with horses which are highly fed also tend strongly to derange the stomach, more especially during warm weather. The bracing influence of exercise being wanting to give energy to the actions of the intestinal canal, the food frequently lodges there. This is also caused by the food being bad. Another cause is irregularity in watering horses, as this element is peculiarly necessary to animals which live upon dry food. Every horse should be watered at least four times during the

day, and in some cases while working hard, more frequently, and in smaller quantities.

REMEDY.—The horse must be bled copiously in the jugular or neck vein, taking at first from eight to ten quarts, as the animal will bear it. After some little time has elapsed, this should be repeated, but a less quantity of blood drawn off. If the lower intestines, or rectum, is overloaded with dung, the hand should be forced up the rectum, and the bowels relieved in this way. If the animal exhibits symptoms of relief, the following medicine should be administered, in the form of a ball :—

Barbadoes aloes . . .	$1\frac{1}{4}$ ounce,
Calomel . . .	2 drachms,
Ginger . . .	3 drachms,
Jalap . . .	$\frac{1}{2}$ drachm ;

these to be mixed with honey or treacle, in sufficient quantity to form a ball.

Sometimes a clyster is useful, which may be formed of the following ingredients :—

Oatmeal gruel . . .	3 quarts,
Common salt . . .	3 ounces,
Olive oil . . .	$\frac{1}{2}$ pint,
or in its stead half-a-pound of butter.	

Or the following :—

A decoction of mallows .	3 quarts.
Lintseed oil . . .	$\frac{1}{2}$ pint.
Treacle . . .	$\frac{1}{2}$ pound.

These clysters may be repeated twice or thrice with beneficial effect.

Blisters behind the ears, Cayenne pepper blown up the nostrils, as well as bark and spices given internally, are perfectly useless. Indeed the two former are ridiculous.

Common Mass

Ground Linseed & Treacle equal parts
Mix so as to form a ball or mass.

Alterative Mass

Powdered Cape Aloes & Soft Soap - 4 oz of each
Common Mass 2 lbs. Mix together.

Dose 1 oz

No. 2

Powd^d Cape Aloes & Soft Soap - 8 oz.

Common Mass 16 oz

Dose 1 oz

Cathartic Mass

Cape Aloes ^{℥ss} 4 - Water 1 lb

Olive Oil 1 - Solⁿ: Carb^s Potassa 1/2 lb

Powder the Aloes, then add the Oil & melt in a
bath & when cooling add by degrees the
solution of Carb^s Potassa. 6 Drachms of this
mass contains 4 Drachms of Aloes.

(D)

Fever Drink

6 oz. Water. 1 Oz Nitric 1 Oz Opium.
1 Bottle Day + night 1 Ball
midday. -

Inflammation of the Bowels

Amst Tart 2³

Lard

6

Mix

2 Oz to both Sides


Applied to
the sides

Purgative Mass.

Take of

Powdered Renum, Nitrate of
Potash, Hard Soap of each
equal parts, beat together so as
to form a mass.

Dose 8 to 12 Drachms



Should the horse sufficiently recover to be able to take food, boiled barley, scalded bran or oatmeal, and lukewarm water, should be given to him for some days until he is able to masticate hay, which ought to be of the best quality. This must, however, be given in small quantities until his bowels have been thoroughly purged out. This will be known by the appearance of the dung, which should be free from the small, hard, blackish balls, and of a yellowish colour.

To complete the cure, the following purgative may be given :—

Lenitive electuary	.	.	4 ounces,
Cream of tartar	.	.	4 ounces,
Purified nitre	.	.	$\frac{1}{4}$ ounce,
Treacle	.	.	2 ounces ;

these to be dissolved in a quart of hot ale ; to be given the first thing in the morning in a tepid state of heat. This may be repeated three or four times, always allowing two or three days intermission between them.

It is hardly necessary to remark, that this disease is in general extremely rapid in its effects, and the utmost promptitude must be exercised in the remedies. In some instances the horse dies instantaneously whenever he falls ; but while he live, there is hope of a cure, however severe the symptoms may appear.

MAD STAGGERS.

SYMPTOMS.—This disease proceeds from inflammation of the brain. In the earlier stages it cannot be distinguished from the *sleepy* or *stomach* staggers. It soon, however, assumes a different character. The nostrils become distended, and he commences to heave at the flanks ; his eyes

assume a fixed, vacant, and wild stare, which is followed by complete delirium ; he becomes furious, and dashes about in a violent manner from side to side, being quite unconscious of his actions.

The mad staggers are considerably alike in their symptoms to rabies or common madness, and also to colic. In the former of these maladies, the horse retains his consciousness, and the violence of his actions will depend upon the peculiar character of the madness. In some instances a desire to be mischievous is manifested. In colic the horse rises and falls, although not in a violent manner ; sometimes, however, he plunges ; but in most cases he rolls himself about, and frequently looks towards his flanks with an evident expression of suffering pain.

CAUSES.—This disease is caused by the animal being too fat, too full of blood, by the chyle having too strong a tendency to widen the vessels ; and especially when the horse is over-heated during warm weather. The fever produced thereby causes a determination of blood to the head, and thus terminating in what is generally denominated “brain fever.”

REMEDY.—The treatment in this malady is at all times exceedingly uncertain. Profuse bleeding should first be resorted to by opening the jugular veins in both sides of the neck. The incision with the lancet should be large, as the more rapid the flow of blood, it is the more likely to prove beneficial in its effects. As much should be taken as will cause him to fall ; or if he is down at the time, until he manifests evident signs of exhaustion. After this the following purgative should be administered :—

Newly-powdered croton nut . . . $\frac{1}{2}$ drachm,
to be given in a drink of oatmeal and water. Every six hours thereafter doses of ten grains should be given, until the bowels are freely moved ; to assist in which, injections of

Lunement of Tar
Olive Oil, Oil of Tar
Equal parts mix.

Cordial Mass

Take of
Powdered Ginger
℥i. Gentian
Equal parts. Sacchar sufficient
to form a mass
Dose 8 to 12 Grachms

Vermifuge Mass
Take of
Chloride of Mercury 20
Common Mass 14
btd into a mass

Dose 1 g

Dear Sir,
I have the honor to acknowledge
the receipt of your letter of the 11th inst.

and in reply to inform you
that the same has been forwarded
to the proper authorities for their
consideration.

I am, Sir, very respectfully,
Your obedient servant,
J. H. [Signature]

warm soap and water should be often used. Or, the following, which is most to be depended upon :—

Aloes 1 ounce,

to be dissolved in a pint of water. Afterwards a quarter of an ounce every four hours until it operates.

After this such medicines should be given as have a tendency to diminish the circulation: foxglove in drink of doses of one drachm each, every six or eight hours; or, instead of the foxglove, tartar emetic in the same quantity may be given.

If the above treatment does not immediately arrest the disease, death is sure to follow speedily

RABIES, OR MADNESS.

SYMPTOMS.—While the horse is apparently in perfect health, he will of a sudden stop, be seized with a trembling all over his body, will paw the ground violently, heave heavily, stagger, and fall down. In a few seconds he will rise again, and proceed a little way on his journey, when he will again stand still, look anxiously about him, and will again come down. He will again get up, and is then seized with the most violent paroxysm of frenzy, attempting to bite other horses or his groom, and will kick and plunge in the most furious manner; and if in a stable, striking at the wall or sides of his stall, or indeed at any object which may be near him, until the perspiration stands upon his whole body like foam. The animal is seized with almost insatiable thirst. He will continue in this furious state until quite exhausted; and will remain in a quiescent condition for some hours, when another paroxysm will ensue. These fits will succeed each other at intervals for two or three days, when a termination will be put to them by death.

It is neither safe nor wise to keep the horse alive under such circumstances. But if the owner is uncertain whether it is rabies with which his horse is afflicted, he should have him slung, which will prevent his injuring either himself or others. The symptoms, however, which we have above detailed are so marked in their character, that they can hardly be mistaken ; and the sooner he is destroyed the better, as there is no chance whatever of his recovery.

CAUSES.—This incurable disorder is caused by the bite of a mad dog, or other rabid animal. Horses have also been known to be seized with rabies, simply from having licked the dog after death, the poison entering the circulation by a sore on the sides of the mouth.

REMEDY.—When symptoms of rabies have manifested themselves, it is in vain to attempt a cure. But in cases where horses have been known to be bitten by a rabid animal, or, under doubtful circumstances, the wound should be well and deeply burned with lunar caustic.

TETANUS, OR LOCKED-JAW.

SYMPTOMS.—To the human being, as well as to the horse, this generally proves a fatal malady. This disease does not manifest itself of a sudden ; but generally steals over the system by slow or insidious means. It first developes itself by the animal appearing heavy and unwell for a day or two ; he feeds sparingly, frequently half chewing his food, and then drops it from his mouth. When he drinks, the water is gulped, in place of the ordinary mode of taking it. The action of the jaw becomes extremely imperfect, and the saliva trickles from the sides of his mouth. The mouth can at length be but imperfectly opened ; and ultimately, the whole voluntary muscles of the neck, head, and upper por-

Tonic Mass

Take of

Powdered Sulph^r of Copper
Ginger: of each 2 ℥^s

Common Mass 1 pound

Beat together so as to form
a mass or

Powdered sulphate of Iron 4 ℥
Ginger ————— 2 "

Beat into a mass if necessary
add same of Strack's

Dose 8 to 12 Grains

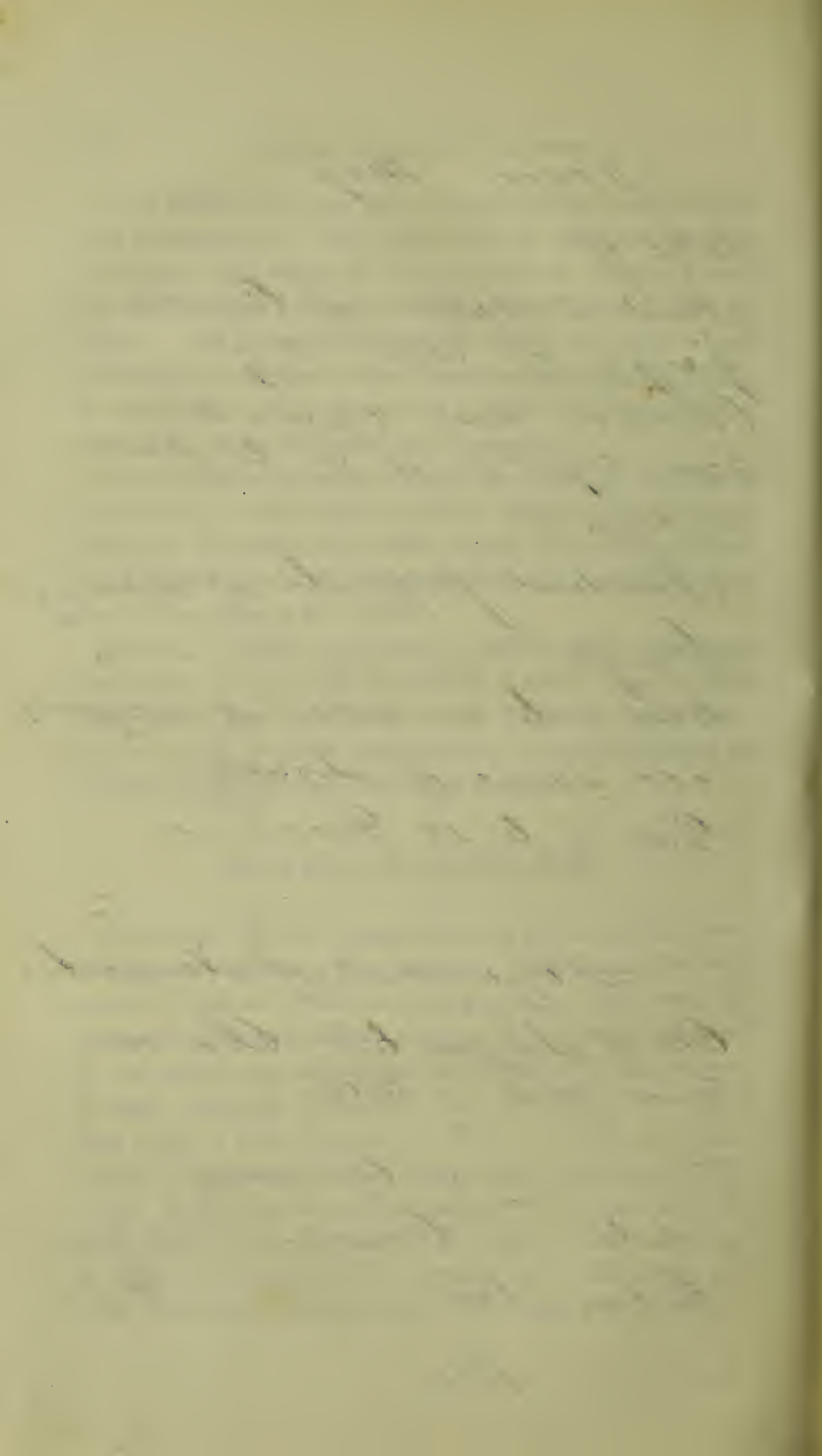
Liniment of Turpentine

Oil of Turpentine, Olive oil
Equal parts Mix.

Liniment of Ammonia

Solution of Ammonia 2 ℥
Olive Oil 1 "

Mix



tions of the shoulders become immovably fixed. After this, there is no hope of the mouth being opened again, and the horse, if not killed, must die of starvation. In a short time nearly the whole muscles of the body are spasmodically affected.

CAUSES. — This disease proceeds from a portion of the nerves being injured, in consequence of a wound having been sustained by one of the ligaments or the tendons. It sometimes comes on instantaneously, after the infliction of a wound, or sometimes a considerable time afterwards. Nicking and docking have frequently caused this affection of the nervous system. It is also often caused by the animal being allowed to cool suddenly when very warm. Worms have also been known to be the remote or proximate cause of tetanus. The bots have also produced it. The usual way in which this disease comes on seldom leads to a suspicion of what it is, as few who have not previously watched its progress can trace its character. Hence, it has assumed its climax before persons are aware of it. In this condition, therefore, it can seldom be cured, from the difficulty of administering medicines.

REMEDIES. — Bleeding has been found to be efficacious in some cases. From eighteen to twenty pounds of blood may be taken from the jugular veins on both sides of the neck. If the cause of the disease has been from docking, the operation should be repeated higher up ; and if from nicking, by making a deeper incision, by these means the spasms have been in many instances removed. Another mode is by counter irritation. Medicine taken in water should be next resorted to. The powdered croton is the most effectual, when the animal is capable of taking it in a drink. Half a drachm may be given at first, and afterwards from eight to ten grains at intervals of six hours, until it acts as a purgative. To faci-

litate this, injections containing a drachm of aloes dissolved in warm water should be administered. A few instances have occurred of this disease being remedied by suddenly dashing pailfulls of cold or very warm water against the animal. Strong blisters applied to the spine have also proved efficacious. Warm clothing should invariably be adopted in this disease.

Should what we have above pointed out prove ineffectual, the use of opium should next be resorted to, in the following manner :—

Opium, pounded to a fine powder, a quarter of an ounce, dissolved in a drink of about half a gallon of warm gruel. This to be followed by a drachm every eight hours, and accompanied by a drachm of aloes. If, however, the jaw is so rigidly fixed that the horse cannot swallow at all, then the above should be administered in the form of injections.

The following purgative has also been found to produce good results :—

Aloes	.	.	.	8 drachms,
Oil of croton	.	.	.	2 drops,
Soap	.	.	.	4 drachms,
Oil of aniseed	.	.	.	30 drops,
Treacle	.	.	.	2 ounces,
Ginger	.	.	.	3 drachms ;

the aloes, ginger, and soap to be well beat in a mortar, and the oil of croton and oil of aniseed added and beaten into them ; after which the treacle must be added, and the whole mixed with a pint of warm water.

To assist in removing the costiveness which usually accompanies this disease, the following injection should be given :—

Olive oil	.	.	.	8 ounces,
Laudanum	.	.	.	1 drachm,
Water-gruel	.	.	.	2 quarts.

In administering the medicine, it is necessary to exercise

Liment of Soap

Soft Soap 27
Camphora 1/2.

Rect'd spirits wine 1 pint
Dissolve the Camphora in
the spirits, then add the
solution of ammonia and
Soap, which having under-
gone solution
filter for use

Liment ful^r of Copper

& Powdered Sulph^r of Copper 17
Grains H^o

Place together in a paper-
over a slow fire till the
compound assumes a red
colour

Handwritten text, likely a letter or document, written in cursive script. The text is heavily faded and illegible due to the quality of the scan. The page appears to be a single sheet of paper with a yellowish tint, suggesting age. The handwriting is dense and fills most of the page.

Fever Ball in Catarrh From Pericard

Camphoris ʒi
Antimon. ʒi
Potassio Tart. ʒi ss
Potassio Nitratis ʒiij

Thaenacae q. s. m. ft. bol -
once or twice a day.

Plummers Ball - Bronchitis
Hyd. Chlorid gr x
Ant. Coy. Sulphur ʒi
Gulac ʒiij
Har. Avenae ʒiij
Sorbith. Vulg. q. s. ut f. Bol
Ankerpasmocoe Ball (Colic)

Opium ʒ
Cayenne Pepper ʒ
or { ʒ ss
Ginger

Venice Turpentine mixed to
make a Ball
It has the properties of a narcotic
Stimulant + trebuchinate.

In a pressing case
Decoction of Aloes ʒ x ij
Tincture of Opium ʒ ij
Spirit of Nitric æther ʒ ij
Water boiling ʒ ss mix

Should the decoction of Aloes - that adm. nat.
be not at hand - a solution of Aloe
or 12 ʒ of Cape - 10 ʒ of Barbados

considerable caution ; as the rigidity of the muscles occasion much pain to the horse if the head be elevated. If it is given in a liquid state, a long slender bent tube should be used ; it must be considerably curved downwards near the point, then an almost straight portion, equal to the length of the animal's mouth from the gullet to the internal termination of the cutting teeth, and from this it should be suddenly turned up in nearly a perpendicular direction, for a foot in length at least, terminating in a funnel-shaped mouth. The perpendicular pressure of the atmosphere will force the liquid down the animal's throat. If the medicine is given in the form of balls, then it should be cut in small portions and stuck on the point of a very thin piece of whalebone, and in this way put down the throat.

In tetanus, the digestive functions are not affected, and the poor animals suffer much from hunger. To keep up the system as far as possible, strong gruel should be given by the aid of the tube above described. See pl. XV. fig. 1.

If, by any of the modes of treatment recommended the spasms are removed, the horse should be fed upon warm mashes of bran and oatmeal for some days ; and should the weather be mild he may be turned out in a field for a few hours in the middle of the day.

EPILEPSY, OR FITS.

SYMPTOMS.—The epileptic fits in horses are, as in the human being, very sudden, of which no premonition is given. The horse suddenly stops, is seized with considerable trembling, looks around him with a vacant stare, and then suddenly falls. This is followed with convulsive struggles of a greater or lesser degree. The head and neck are considerably contorted. The convulsions seldom last more than a few minutes ; he ceases to struggle, and on the recovery of

consciousness, he generally springs to his feet. If in the stable, the horse will immediately commence feeding.

It is exceedingly unsafe to use a horse so afflicted, especially in riding. Indeed we would strongly recommend that after having one fit, he should never be again used for the saddle, as if once attacked, there is every probability of a return of the fits.

We shall not attempt to point out a remedy for epilepsy, as hitherto nothing has been discovered to prove a certain cure. Therefore, anything that may be attempted must be by a regular veterinary surgeon.

PALSY.

This is usually occasioned by blows, falls, or racks in pulling loads which are beyond the proper strength of the animal, and also from inflammation in the intestines. It is, for the most part, situate in the hind quarters. It is therefore evident that it proceeds from spinal irritation. Palsy is, for the most part, met with in draught-horses. Horses so afflicted seldom lie down either in the stable or field, as they have invariably considerable difficulty in getting up again. It seldom happens that this complaint is removed. Blisters, stimulating medicines, and friction are the most probable means to be applied.

GLANDERS.

SYMPTOMS.—Of all the diseases incidental to the horse this is without doubt the most malignant, and most to be dreaded in a steed. The instant that there is any appearance of it, the horse should be immediately removed to a place by itself, as this malady is exceedingly infectious; and from want of due

Ointments

Compound Alum Ointment

Alum in powder	1 lb
Common Turpentine	1 "
Hogs Lard	3 "

Melt the Lard and Turpentine together, add the alum & move till cold.

Ointment of Cantharides

Cantharidis in powder	1 lb
Common Turpentine	1 "
Hogs Lard	3 "

Melt the Lard & Turpentine together in a water bath and when nearly cold add the Canth.

℥	
Barbadoes aloes - powd	3 iij
Carbonate of Potash	3 j
Acacia Powd	3 jss
Boiling water	℔ j mix

Should the decoction be required to keep, two ounces of rose spirit must be added.

1. The first part of the paper is devoted to a general
discussion of the subject. It is shown that the
theory of the subject is very complicated and
that it is not possible to give a complete
account of it in a single paper. The author
therefore limits himself to a general outline of
the theory, and to a discussion of the most
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2. The second part of the paper is devoted to a
detailed discussion of the theory. It is shown
that the theory is very complicated and that
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limits himself to a general outline of the theory,
and to a discussion of the most important
results.

caution, when even a suspicion is entertained, the most disastrous consequences have been the result.

Although the glanders has been known to mankind and described for upwards of one thousand eight hundred years, yet, we lament to state, that little more is known of its proximate cause than at the time we have the first records of its history and treatment. Medical remedies have alleviated the severity of the disease for a time, and arrested its progress, but it is certain to return and prove fatal at last, as it is doubtful if ever this malady was cured.

There are various diseases which in their early symptoms have much the same appearance as glanders, and therefore it is necessary to watch these narrowly, as, of course, perfect recovery may follow.

The very first symptom of glanders is a constant discharge of mucus from one nostril, clearer and of a lighter colour than in a common cold or catarrh, and more glutinous in its substance. If rubbed between the finger and thumb, it has a sticky feel. The discharge also differs from that produced by catarrh, in being continuous, whereas in the latter disease, it is only discharged at intervals.

The matter discharged in this disease differs from that of a catarrh in its specific gravity. If a small quantity is dropped into water it sinks, and it will mix with the water on being stirred with it ; whereas the mucous discharge of a common cold swims near the surface and preserves its slimy consistence, although stirred, and will not commingle with it.

A singular character of the glanders is, that it generally attacks one nostril only, and that is the left one ; only a few cases having occurred where it commenced in the right nostril. Mr. Dupay, a celebrated veterinary surgeon, and director of this school of surgery at Toulouse, mentions, that out of *eight hundred* cases of glanders, which occurred during his practice, only one was affected in the right nostril.

Shortly after the discharge from the nostril takes place, the horse is then affected in the glands of the lower jaw, which swell to a considerable extent, and ultimately become attached to the bone. Another character by which this disease will be known, is, that at no time is the discharge from the nostril accompanied by cough. Some considerable time after the discharge has made its appearance, the gluey substance will be seen accompanying the mucus discharge. It is this pus mingling with the other gluey matter which, absorbed by the circulating vessels and carried to the gland, affects it. However, in common catarrh, the glands are sometimes swelled. But in the real glanders the swelling generally subsides considerably in a short time; and the glands are not in the centre of the channel, but adhere firmly to the jaw. This is a never-failing test of the disease; and besides, it is quite certain that if the discharge flows from both nostrils, that it is not the glanders.

At this stage of the disorder, the mucous membrane of the nostril becomes dark purple or of a livid colour; sometimes of a tone intermediate between these two shades. In some instances there is inflammation of those parts, which varies from the common appearance, being of a purple cast, instead of the high red which usually accompanies inflammation. This is followed by the formation of small circular tubercles on the lining of the nostrils, and these in a short time ulcerate and discharge pus. When this has taken place, there can no longer exist a doubt that the horse is *glandered*. Care must be taken not to mistake the lacrymal or tear-duct for an ulcer. This duct is a continuation of the common skin of the muzzle, which is situate a little way up the nostril; while the ulcerated tubercles are placed upon the mucous membrane above the duct, and well marked by a line of separation.

After the formation of tubercles the animal is certain to

have become constitutionally affected. His coat will stare and fall off; he will lose flesh, and his belly will be tucked up; cough will follow; the appetite will be much affected, accompanied by a rapid diminution of strength; the tubercles will multiply; discharge will be much more abundant, and will assume a purulent and bloody appearance, accompanied with a very foetid smell. The ulceration will extend down the windpipe, and the lungs will be in a very short time studded with tubercles. A test of the lungs having become affected, the breathing will be difficult, and a stifled, grating noise accompanies it, which is a certain prelude to death.

A common catarrh has often been mistaken for glanders; but a little attention will soon enable any one to perceive the distinction between those diseases. Catarrh is invariably accompanied by fever, sore throat, generally cough, loss of appetite, and a discharge from both nostrils, and, in most cases, very copious; sometimes purulent; the glands are generally swollen in both sides of the throat, are moveable and hot to the touch. The proper means being adopted, all the symptoms are abated. Strangles have also been mistaken for glanders. This disease usually affects young horses only. At first they resemble a common cold, with a severe cough and wheezing, and accompanied with a considerable thickening and swelling between the jawbones. The swellings become harder towards the middle, and a fluid can be felt in their centre, which ultimately breaks, and a discharge flows from it. The mucous membrane of the nostrils is of a vivid red colour; and an ample discharge continues, which is mixed with pus from nearly the commencement.

The remote cause of glanders has hitherto baffled all the members of the veterinary art: its true history being still unknown, and the unsatisfactory theories of medical authors

on the subject throwing no light on it, I shall abstain from dwelling upon that part of its history.

CAUSE.—Ill-ventilated and not properly drained stables, we fear, are too frequently the remote cause of glanders. There the ammonia from the urine fills the whole atmosphere; this being constantly inhaled, ultimately produces a poisonous effect upon the lungs, in consequence of an undue quantity of oxygen being breathed. Besides, the constant irritation which it must naturally produce upon that delicate portion of the mucous membrane, which is the organ of smell, it induces the formation of those tubercles which, once formed, can never be eradicated.

We find that glanders almost invariably breaks out in ill-aired stables, and which are besides kept too hot. Fracture of the nasal bone has also been known to produce this malady; as well as a long-continued and inveterate catarrh, with a constant and irritating discharge from the nostrils, may assume the form of glanders. We find that in the lofty, well-aired stables of gentlemen this disease is comparatively little known, and when it does show itself in such, it has in all probability been introduced by some addition to his stud, of one or more horses previously affected. In such a case, all the other animals in the stable may catch the malady, as glanders is known to be highly contagious. In many of the crowded, ill-aired stables of London and other large cities, this disease is but too often an inmate, and frequently great havoc is made among the horses in consequence. Persons who are in the daily habit of riding to town, should bespeak a stall expressly for themselves in a livery-stable, because, by introducing a diseased horse, the infection may be caught by their horses, in consequence of any slight wound about the muzzle coming in contact with the crib, on which the mucus of the glandered animal has

been left, and is thus carried into the circulation. All public stables should have high divisions between the stalls, to prevent the muzzles of horses from coming in contact with each other, horses being very apt to smell at one another in a stable, as it is by this faculty alone they recognise their companions.

From an ill-judged piece of economy, many persons, after being aware of a horse being glandered, persist in keeping it in the same stable with others. Every hour is risking the health of all he possesses. It is the duty of every person, so soon as he is certain of his horse having caught this disease, to destroy it as speedily as possible. For, although a glandered horse may be able to work for a considerable length of time under the influence of this disorder, he will find ultimately that it is a bad piece of economy to keep him under such circumstances.

Many persons who have lost their horses by this disease have resorted to extremes to prevent a continuance of it. Some have even gone so far as to pull down their stables, and others to remove their racks, mangers, and partitions. It is quite sufficient if the mangers and other parts which the discharge from the nostrils have touched, is well washed with a scrubbing brush, with a strong solution of soda and water, and afterwards with chloride of lime, the proportion of which should be a pint-and-a-half to a pailful of water. The walls may also be washed with lime and water, and all the halters, &c., destroyed, and the iron work painted.

CURE.—We have already said that we have never heard of a well-authenticated cure of glanders. Hind says, “Glanders have been cured spontaneously on a large scale, under our own inspection, solely by regular good living; a fine sea-side country and moderate work being the only

adjuncts. With such an auxiliary, *venice turpentine*, diffused in steam at the nostrils, has removed recent cases of glanders, wherein the shankers were already visible, the discharge foetid, and the gland hard and fixed. To apply this remedy, make a bran mash, hot, in which the turpentine is to be mixed; attach this by means of a nose-bag to the horse's head, and renew its warmth in a quarter of an hour by means of a pail of hot water, into which the bag is to be partially immersed. Afterwards cover the body, neck, and head, so as to promote perspiration; but if this does not come on by those means, cover the body first in a large blanket wrung out in hot water; rub dry, cover up, and repeat the same daily. In all such cases we have given salt in every form the patient could take it, in his feeds, in his water, and washed his nose and his legs with salted water. With the same view we hear of sulphate of iron being given in the water, the pail being suspended in the stable for the horse to drink at will."

We have given the above, on the respectable authority of Mr. Hinds, but we have known it to be tried without effect.

Whether this loathsome and fatal disease has its origin in the deteriorated atmosphere of stables, is a problem which has not yet been solved. Little doubt, however, can be entertained, that a strong preventive is clean cool, well-aired stables, and exposing the horse as much as possible to the influence of the atmosphere. For we find that in Arabia, South America, and Circassia, where horses are not confined to stables, the disease is unknown.

CAUTION.—All purchasers of horses at fairs, or from dealers with whom they are not acquainted, should carefully examine horses as to their having this disease. Because they, by infamous trickery, too frequently use means to deceive the purchaser. It is well known that if a horse is galloped

Mercurial Ointment

Sublimed Mercury

& Hoggs Lard equal parts

pretty sharply, that the increased action in breathing will thoroughly drive the mucous substance out of his nostril. And to make it continue dry for a time, they force a pledget a considerable way up the diseased nostril; after having blown powdered alum or white vitriol into it. But a little attention will enable any one to perceive that the animal is in pain, and will make ineffectual efforts to sneeze; and the foetid smell, so different from other discharges, will at once convince even an unexperienced person that the horse is glandered.

FARCY.

SYMPTOMS.—This disease is nearly allied to glanders. Some have supposed it a modification of that malady. This, however, is a mistake, as they are essentially different, as we shall point out. We have given it as our decided opinion that glanders is incurable, but not so farcy. The first symptoms manifested are the appearance of small tumours, popularly called *farcy buds*, or *buttons*, situate close to some of the veins and following their course, connected by a sort of cord; and hence they are called corded veins by farriers and veterinary surgeons. At first they are generally very small, and consequently may not be noticed for some weeks, until they have attained their full size; after which they usually increase more rapidly, become hot, and cause considerable pain, and at length ulceration ensues. They first make their appearance about the face, neck, and throat; sometimes extending to the inside of the thigh, and produce lameness, and considerable swelling of the limb. A foetid discharge generally proceeds from both nostrils, which, in process of time assumes all the malignant characters of glanders, and is equally as contagious.

It sometimes happens that farcy is progressing in the con-

stitution long before the buds make their appearance, or swelling along the course of the absorbents takes place. In some instances, the buds do not ulcerate, but assume a callous texture, in which case they are very difficult to reduce. At this period an apparent check to the disease takes place, and the horse seems to be quite recovered. This, however, is only a delusion ; and although no symptoms of the complaint manifest themselves for a number of months, it is working in secret, and all at once breaks out in a most malignant form, and probably in a few days he expires under its influence.

Sometimes a considerable swelling of the head takes place, especially in the region of the muzzle, and from which an extremely foetid mucous fluid is discharged. Various portions of the body exhibit mangy eruptions ; swellings in the limbs will follow, the heels will become cracked, exhibiting all the appearance of grease. The animal in most cases will become emaciated and weak.

Farcy assumes many different appearances in its various stages. It is no uncommon thing for one of the hind legs to swell suddenly to a very large size, frequently upwards or three times its natural dimensions, accompanied by abrupt projections and depressions, and which the poor animal will be unable to move. This is generally accompanied by a considerable degree of fever.

The above swelling differs materially from that which is usually denominated farcy humour. In this the skin presents a red and shining appearance, from the whole surface of which exudes a thin fluid, accompanied by great lameness. The fetlock is round, tumid, and smooth, and swollen as far as the heel. This disease is in consequence of want of proper exercise, and being over-fed at the same time. Painful and disagreeable as this malady is, frequent fomentations

of a decoction of marsh-mallows, and smart doses of medicine, will speedily reduce the swelling, and especially if the swollen part is well rubbed, and the horse subjected to gentle exercise.

CAUSE.—Bad stable management, want of exercise, and infection, are the causes of this complaint. There have been many occurrences of the disease which could not be accounted for upon any other principle than that it was contagious. In certain localities it has been known to be prevalent where horses could not have come into close contact with one another.

TREATMENT.—In the early stages of farcy, the horse should be subjected to gentle doses of medicine. The following may be given as a dose :—

Barbadoes aloes	.	8 drachms,
Castile soap	. .	2 drachms ;

formed into a ball, with liquorice powder, half-an-ounce.

Others recommend the following ball in this early stage :—

Corrosive sublimate	.	$\frac{1}{2}$ drachm,
Powdered aniseeds	.	1 ounce ;

mixed with sufficient syrup, and made into three balls. These to be continued for eight or ten days successively. But with some constitutions the above does not agree ; in that case, half-a-drachm of opium may be made into a ball with meal and mucilage, and given as a dose, but should it not prove effectual, the same quantity may be given in twelve or fourteen hours after the first, that is, if purging and staling is produced in too strong a degree. The above are doses for a horse of delicate constitution, but for horses of more robust habits, after a few days, the mineral substance may be increased to double the quantity, as well as the aniseed.

The above applies to the stage of the disease when the farcy buds are unbroken. If any of them have begun to ulcerate, the welding iron should be brought to a dull red heat and gently applied to them. But if upon feeling that they are filled with matter, even if they have not ulcerated, they should be punctured with the welding iron. These should be carefully examined for some days afterwards, and if they exhibit an unhealthy spongy appearance, and a thin glary matter issues from them, then they should be frequently washed with the following lotion :—

Corrosive sublimate . . . 2 drachms,

Spirit of wine . . . 4 ounces ;

this wash should be continued until the bottoms of the ulcers assume a clear red appearance, and the spongy foul look has been dissipated. When this is the case, the matter discharged will have completely changed its aspect, and instead of being thin and glary, it will have become thick, and of a white or yellowish colour. Friar's balsam should now be applied to them, which will soon show its healing influence. During this time, should others of the buttons be found to contain matter, they must be treated as above directed.

At this stage the disease will have attacked the constitution, it will therefore be necessary to institute a more rigid medical treatment. The following is the best alterative :—

Corrosive sublimate . . . 10 grains,

Gentian 2 drachms,

Ginger 1 drachm ;

the above to be administered morning and evening, until the ulcers have dried up. But if this recipe acts violently as a purgative, or if the mouth of the horse becomes sore, one drachm of blue vitriol (sulphate of copper) may be substituted for the corrosive sublimate.

It not unfrequently happens that one kind of medicine often administered loses its effect ; in such a case, the following may be substituted for the above recipe :—

Sulphate of copper	.	3 drachms,
Corrosive sublimate	.	1 scruple,
Powdered bark	.	2 drachms,
Powdered ginger	.	2 drachms ;

to be mixed with Venice turpentine, sufficient to form it into three balls, to be given morning and evening, as above directed. Probably in a few days the above must be made into two balls only, to produce the desired evacuations ; but should the intestines be moved too severely, recourse must be had to the opium ball, as formerly directed.

During this treatment the horse should be kept apart from all others, and his food should consist of green meat ; but if in the winter season, carrots or potatoes, with the addition of a moderate quantity of corn, with either of the kinds of food. He should be freely exposed to the air, and if in the summer season, he should be allowed to run in a field for four or five hours daily, but to be carefully stabled during the night, as his system, under the above course of medicine, will be open, and consequently very susceptible of the effects of cold. In the winter, when the weather is fine, he should be walked out for an hour in the middle of the day regularly.

Instead of burning the ulcerated farcy buttons, some prefer applying the following escharotic mixture.

Muriatic acid	.	2 drachms,
Muriate of mercury	.	1 drachm.

The above to be well mixed together, and then add,

Pure water	.	4 drachms,
Spirit of wine	.	6 drachms.

Should it be found to produce too much irritation, then more water may be added.

In applying the above, it should be done with a small bit of sponge or rag tied to the end of a piece of stick, as it will blacken the skin of the operator if touched by it, although immediately washed off, and the stain will continue until the surface of the skin is worn away.

In cases where severe salivation ensues from the use of corrosive sublimate, (which is, in fact, a preparation of mercury,) which not unfrequently happens with horses of a delicate constitution, the following purgative should be given :—

Epsom or Rochelle salts . . . 7 ounces,

Sulphur $2\frac{1}{4}$ ounces ;

mixed with liquorice powder and treacle, and formed into a ball, to be repeated for two or three days.

When farcy is attended with very great swelling, recourse must be had to bleeding, as well as to purgatives ; the limbs must be subjected to frequent fomentations with water, made as hot as the animal can bear it ; to be applied by soaking cloth in it, and wrapping it round the limbs.

NASAL GLEET.

SYMPTOMS.—This is a constant discharge of a thickish fluid from the nostrils ; proceeding from the mucous membrane, which lines the internal cavity of the nose.

This disease is frequently brought on by the effects of a long-continued discharge from catarrh or cold. It is unattended with any feverish symptoms. The flow of this thick mucous gleet is often very considerable, and variable in colour. When the horse is living upon green food, the discharge is of a bright grass-green colour ; but if his diet consists of dry food, and he is kept in the stable, then it assumes a very different hue ; varying from cream-white to brown, or straw-colour, and mixed with pus in some instances,

Incontinentia Urinae

Radix Tormentillae with
Bitter & Spicy admixtures -
& the parts washed with cold water
& alum - 4 days afterwards

Sacchari Saturni ʒij

Pulv. Hyoscyami ʒij

Rad. Calami

Farinæ Secalinar, aa ʒij

lig. font. q. s. ut fiat electuarium.

8 days afterwards

Increase the dose of sugar of lead to ʒss

and in others mingled with blood. The discharge is sometimes continuous, and at others it is only occasionally sneezed out. In the latter case it is generally thick, and when so, the disease is on the wane. If, however, it is of long duration, it sometimes assumes a serous aspect, and may ultimately prove fatal to the horse.

CURE.—Give the following medicine twice a day :—

Sulphate of copper, or blue vitriol . . 1 drachm,
made into a ball with treacle and flour.

Should this disease be attended with cough and fever, then the following draught must be prepared :—

Lintseed	.	.	.	.	1 pint,
Treacle	.	.	.	.	8 ounces,
Vinegar	.	.	.	.	1 pint.

The lintseed must be soaked or decocted in hot water for three or four hours, kept close to the fire, or on the hob of a grate. Let it be poured off, and the quantity of this tea which remains must be six pints. Then add the other ingredients.

Give the horse half-a-pint from four to six times during the twenty-four hours. The above tonic, consisting of sulphate of copper, should be continued along with the cough mixture. Should pus be found mixed with the nasal discharge, and the smell be disagreeable, then the following tonic medicine must be given :—

Sulphate of copper	.	.	.	1 drachm,
Gentian	.	.	.	2 drachms,
Ginger	.	.	.	2 drachms,
Treacle	.	.	.	$\frac{1}{2}$ ounce;

to be administered in a single dose, and repeated daily while the above symptoms continue. But if not removed in a few days, there is reason to expect that it will terminate in glanders.

POLYPUS.

This a long worm-like substance which grows in the nostrils, and although not painful, is attended with disagreeable consequences by obstructing the breathing, and often proves very annoying to the animal. We need not treat more of its cure or otherwise, as it can only be removed by an operation, which requires the aid of a skilful veterinary surgeon.

LAMPAS.

SYMPTOMS.—This is disease of the palate : the lower bars, or those next the muzzle, sometimes swell to a great extent, frequently parallel with the cutting edges of the teeth. It is a painful malady, and the horse has much difficulty in eating while under its influence, from the pressure of the food. Young horses are most liable to it.

CAUSE.—It is supposed in many instances to arise from inflammation in the gums, spreading to the approximating bars, especially when young horses are shedding their teeth. It is also produced by young horses having fever, brought on by over-feeding, especially after being removed from grass to a stable diet.

REMEDIES.—In most instances this disease will go off without medical aid. Slight purgatives and some mashes will facilitate its removal. The animal will also be relieved by a few slight cuts across the bars. This may be done with a penknife or lancet, only the operator must keep clear of the palatine artery ; the situation of which will be obvious by a reference to plate III., fig. 2. *e, e*. This will allay the inflammation, and alleviate the pain which the animal suffers. It is a common practice with farriers to burn the bars with a red-hot iron, a mode of treatment which cannot be too much deprecated.

- Op. - 100 - 10 -

2 Pains Hyd. Batta 3ij

Forma Alla 3ss

Can let down g.s. +

carrying spirit the about 1/2

part of it over the wound

then apply some tow +

more of the Powder over it.

do this again more tow place

has been dipped in Beer

grounds + flour. Make more

of the Beer grounds with

Paleas chlorinate + make

a thick paste which spread

over the tow then again

place more tow above it -

then roll up the whole

by with a cord; after this

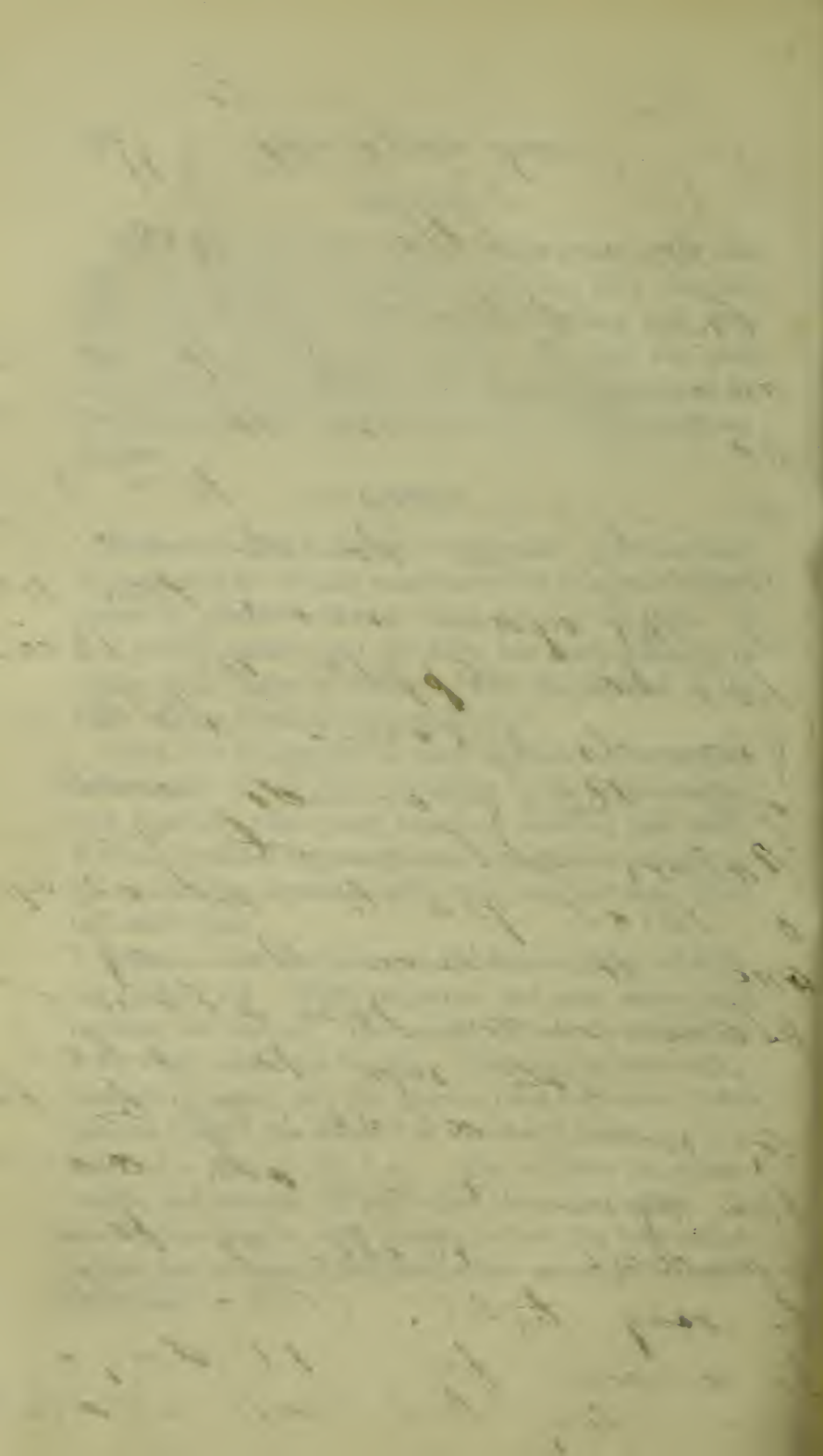
roll again + an other cord

bandage, with of them to

be very tight. Then then

to remain for 12 days.

Don't stir, but keep it dry.



THE STRANGLES.

SYMPTOMS.—This is a disease incidental to young horses, and few colts escape it. Occasionally it attacks old horses, in which event it is more difficult to cure. The usual period at which this disease shows itself is in the fourth and fifth years, although it is by no means uncommon to attack horses two years earlier. High-fed colts are more liable to be seized with it at an earlier age than those which are kept upon a lower diet. The first symptom is cough, differing but little from that of a common cold, only that there is a more abundant discharge from the nostrils, which is of a yellowish colour, and unaccompanied by a disagreeable odour: it is also in most cases mixed with matter. There is, besides, a profuse discharge of slimy, stringy fluid from the mouth. The membrane which lines the nose is intensely red. It will be found that considerable swelling has taken place under the jaws and accompanied by fever, which is distinguished by want of appetite, a quick pulse, and a hot mouth, a general weakness of the whole frame, producing a dejected appearance. There is likewise a quick motion of the flanks, and coldness in the ears and limbs. The swelling is in the form of a tumour between the jaws; increasing with various degrees of rapidity, occupying nearly the entire space, and gives pain to the horse when eating; he besides manifests a great disinclination to feed. This is accompanied by much thirst, but the swelling prevents him from indulging in water, and having swallowed a mouthful or two he desists. After which, and even after eating, he is frequently seized with a spasmodic cough, with suffocating symptoms. The swelling is one uniform body, and consequently differs from the enlargement of the glands in catarrh and glanders.

CAUSE.—Neither the remote or proximate cause of this

complaint are known. It appears to be in some degree analogous to the small-pox in the human being; and having passed through it, the constitution of the animal seems to have undergone purification and improvement. In some instances it has affected the animal in so mild a form, that it has passed through its various stages and gone off without much inconvenience to it, or any remedial means whatever having been employed. Contagion seems to have nothing to do with the disorder. Every horse has this complaint once during his life, and once only.

REMEDIES.—As the principal source of the complaint consists in the swelling between the jaws, the first thing to be attended to is, to bring the tumour to a suppuration. A sharp blister is the first thing to be applied. This, administered in time, will facilitate the discharge a week or two earlier than it would have taken place, if allowed to come to a period naturally. It will also have a tendency to draw out the inflammation from the mucous membrane of the throat, and consequently greatly ameliorate the cough. The old practice of applying poultices and fomentations were very ineffectual appliances, from the great thickness of the skin of the horse. The following stimulating ointment may be applied with advantage after the removal of the blister :—

Camphor	.	.	.	1 drachm,
Hog's-lard	.	.	.	1 ounce,
Oil of origanum	.	.	.	$\frac{1}{2}$ drachm.

Shortly after having been anointed with the above, a large and hot poultice may be applied, and both repeated twice a-day until the tumour is full of matter and is quite soft. It frequently breaks of its own accord; but if it should not, it must be laid open with a lancet, from the bottom upwards. The matter must be well squeezed out, and the lips of the incision kept open with a piece of lint for several days, until

the matter is completely discharged; otherwise, a second tumour may be formed, which frequently proves difficult of cure. After the matter is dislodged, a small quantity of Friar's balsam should be injected into the cavity of the tumour daily. It will be found that where tumours break spontaneously, the lips of the wound, from having uneven edges, will be more difficult to cure.

At this stage of the complaint, if there is no unusual degree of fever, the following laxative draught should be administered:—

Barbadoes aloes	.	.	.	2 drachms,
Castile soap	.	.	.	1 drachm,
Common salt	.	.	.	4 ounces,
Water	.	.	.	1 pint.

If there is much fever, with difficult breathing, proceeding from an affection of the chest and the lungs, it will be necessary to resort to bleeding. But it ought to be clearly ascertained whether this oppression proceeds from the swelling of the throat; for if it does so, then bleeding would be injurious, because it would have a tendency to retard the progress of the suppuration. Cooling medicines will be beneficial at this time. Two or three doses of the following cooling prescription will be found beneficial:—

Nitre	.	.	.	1 ounce,
Tartar emetic	.	.	.	2 drachms.

If there is no fever, the animal will soon manifest a desire to eat. His food should principally be oatmeal gruel and bran-mashes, with a supply of green meat, consisting of cut grass, or tares. Should these not keep the bowels sufficiently open—which is of great importance in diseases of this kind—then the above laxative must be given: this will have the effect of preventing eruptions, which sometimes follow the strangles; and nothing more will be required, if it operates freely.

If, however, the complaint is followed by weakness, it will be necessary to have recourse to the following tonic medicine, which should be repeated daily until the horse recovers strength :—

Ginger	.	.	.	2 drachms,
Camomile	.	.	.	2 ditto,
Gentian	.	.	.	2 ditto.

In bad cases of strangles the parotid gland will swell to a great size, and even become ulcerated ; and in other instances an accumulation of fluid will take place, from swelling of the duct, and cause the vessel to burst. In this event a fistulous ulcer will follow, which will be found very difficult to eradicate. In such a case, it will require the aid of a regular veterinary surgeon, as an operation must be had recourse to, which no one but a regular and experienced practitioner will be able to perform.

Strangles seems incidental to almost every horse ; and as it is a complaint which is often of long continuance, foreign veterinary surgeons conceived the idea of inoculating to produce a milder degree of the disease. This they performed either with part of the discharge from the nostrils, or with matter from the tumour. In many cases this has had a most beneficial result, being both shorter in its duration and milder in its effects.

CANKER AND WOUNDS IN THE MOUTH.

It is but a too common occurrence, that the sides of the mouth and other parts are wounded by the bit, which may be either too acute in its edges or may not fit. Frequently deep wounds are in consequence inflicted in the sides and inner parts, more especially between the grinders and the tushes, on which the bit rests. It is no uncommon occurrence for the entire flesh to be removed from between the

Notes of remarkable
Cases in Dissecting Room
& practice at the City College.

16/12/58

Bk. Perry M.

Uterus full of pus & mucous
watery fluid. No note of the
case taken during life.

18/12/58

Bro: Golding.

On student cutting
the skin & opening Thyro. Gland.
They came in contact with an
abscess. The abscess commenced
on left side, the Pharynx by a
small opening, it then spread
backwards & upwards to the top
of Arytenoid Cartilage & on top
of Oesophagus & from there it
extended downwards to the
Pericardium & at this point
it was first discovered. The Cyst
of the abscess was distinct & con-
tained a large quantity of

of healthy Pus, but this
purulent fluid being mixed
with a considerable quantity
of Hay &c. which passed into
the opening at the Pharynx
as it had to pass its opening
to get to the Oesophagus, had
a very fortid smell.

Symptoms discharge from nostrils
& want of appetite.

Cause probably a stick had
made the opening at first,
then the food getting in
had kept up the inflammation.
& thus the fear having subsided
about first up & then
down in quest of a depredating
crippling. Perhaps they had
been giving a Ball on
the point of a stick

Bru Cab. H 21/12/38

Came lab at evening
of day in question. Part, complaint
of the having colic, pains & a
sore shoulder. The time Mr. Mattingly
was getting a light gave a
groan, fell down & instantly
died. Next day made Post
mortem & found as follows.

Stomach. Peritoneal coat
very red & the same on the intestines.
Suffocating smell when abdomen
laid open. Internal surface of
mesoic coat of ^{first} intestine red
& presenting circular patches.
The villous coat of stomach was
intensely red & appeared remarkably
prominent & as it were stood
out in relief & the red circular
patches were more distinct
than on the intestines. The mucus
was thick very abundant & &
contained a considerable
quantity of Bran mixed up with it.

The Splenic Vein + communicating branches coming from the Stomach were highly congested + likewise the vein on the Mesentery. The Arteria was not the least congested.

The Liver was much enlarged. Glisson's Capsule separated easily from it with the finger + it expressed two large white spots where the membrane was thickened + the liver firmly adherent.

The left Lobe apart of the Right was softened + friable like & when held up, broke into pieces with its own weight.

The Lungs were healthy.

The Left Ventricle dilated + atrophied. The walls of Right extra thick + the Auriculo Ventricular valves yellowish in colour + slightly fused (or cartilag).

tushes and grinders, and instances frequently occur of the bone likewise being so injured that portions of it have been torn away. It may be well conceived the very great pain this must occasion to the poor animal. Those who have had even a very slight inflammation of the gums, will readily have an idea of its sufferings.

Every man of feeling will make it his first study to see that the bit fits the mouth of his horse properly, and that it in no way can injure either the sides of the mouth or palate. Even his own comfort ought to dictate this; for no horse can perform his work pleasantly while he is suffering from an irritation in the mouth.

When the owner of a horse finds that the bone of the jaw is injured, he should immediately apply to a veterinary surgeon; but wounds and ulcers may be cured without the aid of a practitioner. The most simple remedies are tincture of myrrh, diluted in an equal proportion of water. The parts should be frequently washed with this; or, dissolve an ounce of alum in a quart of water, and use it as a wash. If the wound has become a settled ulcer, and looks foul in the edges, then it should be touched with lunar caustic, or with the liquid nitrate of silver, which will stimulate it and cause it to heal. At the same time the above wash should be applied to the parts. It will be proper to give a dose or two of the laxative mentioned at page 30, in the case of Farcy.

DISEASES OF THE TONGUE.

TONGUE BLADDERS.

SYMPTOMS.—A careful groom will occasionally examine the interior of the mouth of horses under his charge. If he notices any swelling of the tongue, he must ascertain from whence it proceeds; or his attention may be directed

to this organ by a discharge of ropy saliva from the sides of the mouth. This will be found to have its origin in inflammation, caused by one large or many small bladder-like swellings on the under sides of the tongue, frequently extending its whole length.

REMEDY.—If these bladders are fully charged with matter, they should be opened with a lancet, from one end to the other, which generally puts an end to the complaint, and the swelling will quickly subside. Should any degree of fever remain, a few doses of the cooling prescription mentioned at page 30 should be administered.

BITTEN TONGUE.

It often happens that horses bite their tongues. This takes place generally during sleep. If the wound be slight, it will heal of its own accord; but when of large extent, veterinary aid must be called in, as it would be unsafe for a person not thoroughly acquainted with ^{anatomy} pathology to attempt a cure.

VIVES, OR SWELLINGS IN THE SUBMAXILLARY GLANDS.

During catarrh it is no uncommon occurrence for these glands to become enlarged, and also after strangles. In such cases, stimulating embrocations may be used, which generally relieve them; or they may, in most instances, subside, after the cause which has induced the enlargement has ceased. We would on no account allow operations to be performed for their removal.

These swellings are readily distinguished from those which accompany glanders, by their being, for the most part, larger, less distinct, and occupying the centre of the space between the jaws, and in never adhering to the jawbones, as in glanders.

The Pericardium contained
a considerable quantity of
serum. The Mesentery contained
2 large Tubercles.

The appearances on stomach
are not inflammatory, but
the result of congestion the
death having taken place
apparently during digestion
& when the stomach is filled
with a quantity of food.

The sudden death being
due to the depressed state
of the vessels & their action
producing high congestion
of fatal circulation &
inflammation of liver.
Kidney enlarged & softened.

18/2/59

Bo Con from Roelui
dead.

History. Mr. Johnstone Roelui
purchased the animal today
past last Wednesday at
Edinbo Market from Mr.
John Martin Cattle dealer
10 High Reg. Edinbo.

The animal was purchased
at 2 O'clock as she appeared
unweary she was milked at
Clair St. but gave little
milk & after being milked
she was driven out to
Roelui. As she appeared
still unweary Mr. Johnstone
sent for Mr. Johnstone
of S. Roelui who states that
the unweary was due to
retention of cleavage
& removed by the hand.

The animal state continues
to surge & press on & strain &
expand the uterus & during the
breeding the tail was stretched
out & sometimes the fingers
furrow were erected as if
indignant. The urine was
erect in jets & appeared
blanched in color. The
furrows altho' fluid had no
unpleasant smell or un-
natural color.

The animal after the first 2
or 3 days ceased to drink
or eat rumination being
suspended. The secretion
of milk never was above
a couple of tea cupfuls
& laterally it ceased & was
of a yellow color. It
was the same color & a
little in quantity when
milked at Clark St, after

Altho the udder appeared full.
She never appeared to be suffer-
ing abdominal pain & never
kicked at her flank but the
breathing was always irregular
& the straining & coughing
of the tail a constant
symptom.

Doc. Bran & hauled Yarnips
& the udder was drawn at
least 6 times daily. She
appeared always perfectly
sensible & hands were
never constipated. She
died last Thursday
night sometime after
11 O'clock being found
dead in the morning.

Postmortem. Externally
eye sunken in orbit as if
did suffering great pain
only the eye appeared
red the external vaginal
opening was dilated & full
of blood & clots of pas.
The back presented 4 ulcers
upon its smooth internal
surface these correspond
to the external vaginal opening.
The ulcers appeared to have been
somewhat fresh & were healthy
& filling up.

The ~~uterus~~ uterus contained little
milk & was yellow thick like
Pas.

The ~~uterus~~ uterus had contracted
after parturition & the right
horn was much smaller than
the left (owing to the calf lying
in it)

Externally the uterus presents a
red appearance but no trace
of inflammation.

On cutting it open it was
full of Pus & Fibrine in the
act of breaking up. After
washing the organ the mucous
membrane appeared thick &
black coloured & the mucous
membrane presents double
folds at little anterior to
the Os Uteri. The Placental
membrane, had been all
removed & the cotyledons
had also contracted but
in all of them there were
small threads of fibrine
firmly adhesion rather than
well enter which took some
difficulty to draw out.

BARBS, OR PAPS.

In inflammation of the mouth, produced by catarrh or any other cause, the ducts situated on both sides of the frænum, or bridle of the tongue, sometimes enlarge, and a redness is to be perceived under it. No operation is necessary in this disease; the only thing to be attended to is the removal of that which causes them. Unskilful and bigoted farriers often operate for the paps, but in this event the cure is worse than the disease, as abscesses are likely to follow operations, which years may not eradicate.

GIGS.

The sublingual glands are liable to inflammation during colds. They are situate under the tongue, or on its lower surface. They assume the appearance of small pimples when inflamed. If they ulcerate they should be washed with a solution of alum, or tincture of myrrh, which will always be found to heal them. Operations seldom fail to prove injurious.

DISEASES OF THE TEETH.

Little is known of the diseases of the teeth in horses. It seldom happens that rottenness takes place. From the constant use of the grinders, in chewing grain and straw, they are often worn down, and their edges occasionally present a sharp and rough appearance. This cuts the inside of the cheeks. To prevent this they should be filed down.

If from the above cause the cheek has been cut, and an ulcer produced, it must be frequently and carefully washed, either with a solution of myrrh, or alum and water; and if it prove obstinate, nitrate of silver must be had recourse to.

Sometimes the teeth grow irregularly in length, more especially the grinders. This proceeds generally from these

teeth not being placed immediately opposite to each other. Instances are not wanting where such teeth have grown three quarters of an inch, or sometimes more above the general level of the grinders or molar teeth ; and this pressing against the bars of the mouth irritates them, and generally ends in ulceration. The only remedy for this is to file the projecting tooth down to a level with the others. Unless the ulcer is very deep and spongy, it will heal of its own accord ; but should it prove otherwise, its edges must be touched with lunar caustic or nitrate of silver, after it has been well washed out with a solution of alum and water in the proportions as recommended at page 31. It often happens, from want of attention on the part of the groom in this case, that the horse will not take his food, and will in consequence pine away, lose flesh, and become quite dispirited.

Teeth that have thus grown will always have a tendency to shoot out again, and must therefore be watched to prevent a recurrence of ulcers.

In all diseases of the mouth horses will half-chew their food and then drop it, which is familiarly termed "quidding their food."

DISEASES OF THE LIPS.

Few persons are aware of the very great importance of the lips of horses. They may justly be considered as the hands of that animal. Without their aid he could neither collect his food in the fields, nor even convey corn down his throat. To prove this, I shall give an account of an experiment which was tried with an ass, to ascertain the extent of the use of these important organs. The nerves which give feeling and sensation to the lips were divided, and instantly it was perceived that he was not aware when

The Arteries nor Veins contain
no gas but blood dark &
faintly crystalline.

The Bladder contains a
yellowish fluid of an acid
pale high colored -

The Pancreas was filled &
repletion with food soft
& apparently from turkeys.
2 large buckets were taken
out of it - The other stomach

contains little except a few
bits was all but empty
& the stomachs were in the
same state. The remainder
of the Ocean healthy.

19/2/59

Mr. Henderson Row
Called this day requesting
me to see Cor of his.

History. Early this morning
the Cor appeared uneasy, would
not eat & moaned a little.

At 10 O'clock much worse &
at 12 I saw her.

Symptoms. Moaning loud
& pained; breathing hurried.
Skin & extremities warm.
Head carried low & eye painful
mouth warm, tongue dry
(no horns) pulse 95 - hard but
small. No Cough.
Auscult. Sound of Trachea &
Bronchi very loud. No hyperinflation
of Lungs. Abdominal muscles
drawn up & heaving at flanks.
Diagnosis. Infl. of Lungs.
Gravimetric. Abstract 1 lb of blood
3 1/2 of urine in water.
Visited at 8 O'clock same

same evening.
Pulse 84 Soft. Lacks lively
muscle movt. Respiration
slightly quick. Sound of lungs
much the same. &

22/2/59 Pulse 60 Soft & regular
Respiration little accelerated.
Sound of Lungs almost
normal. All symptoms having
abated dose has been reduced.

R Sulp. Magn: ℥ iij
Calomel ℥ j
Carb. Ammonia ℥ ss

Mixed &

℥ j of Water morning &
evening.

Mr. George

Some that had been a thumping
to pig for 4 days. Being ant
sent 4 students who after
3 hours work managed to
abstract 1 Pig (dead). They could
find another but as it
lay across the 6 Ulteri
they were unable to remove
it. At 8 O'clock 2 more exp.
took a Cab & 7 students with
me. Removed the Pig that
lay in the passage. As the
animal was down & unable
to rise & as I could only
touch the pig with my
fingers I determined on
performing the Cossarian
operation. which being done
I removed from the Right
Horn 5 Pigs & from the Left
3 Pigs all dead. The Right
required 4 openings in it &
the Left only one.

he touched food with them. They were entirely divested of motion, and he was in consequence unable to convey the oats, with which his manger was full, to his teeth. Compelled by hunger, he made a violent effort to lick up a few with his tongue, but they were nearly all rubbed off before they could be conveyed to his mouth.

The angles of the mouth are frequently lacerated, and become sore by the smallness of the bit, and from the unmerciful dragging of a heavy hand in either riding or driving him, and also from the shortness of the snaffle. This frequently induces the poll-evil. The severe excoriation of those parts produces deep ulcers, which cannot be removed while the animal is worked. Washing with a solution of alum is one of the best curatives; and if the sore is callous, it must be burned slightly on the edges with nitrate of silver.

DISEASES OF THE EYE.

In the horse the diseases of the eye are not numerous; but they are of frequent occurrence, and often most difficult to cure.

COMMON INFLAMMATION OF THE EYE.

SYMPTOMS.—This malady generally makes its appearance unexpectedly, accompanied by considerable swelling of the eyelids, which has the effect of partially closing them, and causes a discharge of watery matter, or tears. The lid exhibits inflammation, and some of the vessels of the eyeball are gorged with blood. There will also be a dimness in the cornea.

CAUSE.—This usually accompanies a catarrh. But it may also be caused by substances getting under the eyelid, such as a seed of hay; or from a blow. When inflammation occurs, the eye should be carefully examined, so that the

cause may be discovered. This seldom affects the health of the horse, or prevents his feeding.

REMEDIES.—The eye should be bathed with the following lotion :—

Sugar of lead	. . .	1 drachm,
Rose-water	. . .	6 ounces.

If this does not speedily abate the inflammation, then use the following :—

Tincture of opium, or laudanum	$\frac{1}{2}$ ounce,
Water	. . . . . 1 pint.

Or the following will prove equally efficacious :—

Powdered leaves of digitalis	. . . . . 1 ounce,
Boiling water	. . . . . 1 quart.

His food should consist of mashes, with mild doses of physic. Three or four days should remove the disease.

OPHTHALMIA.

SYMPTOMS.—This is manifested by great inflammation in the eyelids, as also the cornea and aqueous humour and iris, all of which assume a dim appearance, and lose their transparency. The animal can hardly open its eyelids from the pain produced by exposing the eye to the action of light. This disease is extremely difficult to combat ; and after a month's constant treatment the eye will exhibit an alternation of remission and increase of the inflammation day after day. One day it will have all the appearance of being nearly well, and on the next exhibit more unfavourable symptoms than it has before assumed : the gorged appearance of the inner membrane of the eyelid will be much abated, and the inflammation on the white of the eyeball will have nearly quitted it ; the hazy aspect of the cornea have assumed a certain degree of clearness, and to all appearance the malady has taken its departure.

12/3/59

Mr. Braid Farm.

Norwegian Cow - dun + white.
Symptoms of parturition at
5 O'clock not being able to calf
I went at 11 O'clock. but
had to cut the calf away.

Monday visited. pulse 108 strong
but little swelling + appearing
to do well.

Tuesday noon. died on Thursday

Post mortem. 3^d Stomach full
of dry food. Bladder very
small being rigidly contracted
+ apparent traces of inflammation
upon its external surface also
shreds of fibrin between it + the
burn of pelvis. G. Muscles +
membranes coats exceedingly
red + infl^d.

Uterus on its peritoneal surface healthy. Abdominal peritoneum healthy. Horns + body of uterus not contracted. Interior of uterus full of dark crimson coloured fluid: when this fluid was washed out the mucous membrane was of a dark red colour. the whole appearance was of exudation but little of inflammation.

The uterus was remarkably tender & easily torn & its fold appeared bathed in a red serous fluid.

The Os Uteri + other parts where the pressure was exerted in calving the animal was firm + hard + presented true traces of inflⁿ. The blood vessels at this part were also plugged up with firm coagula of blood.

It seldom happens, however, that it is so, for in six weeks or two months we too frequently find the eye again affected with all its former redness, often worse than on the former attack ; or oftentimes both eyes affected. Indeed from time to time a succession of these abatements and attacks will have succeeded one another, until a cloudy appearance and permanent opacity of the lens or capsule of the eye have taken place ; and confirmed blindness in one or both eyes is the final result.

CAUSE.—The constant heated air of the stable may be considered the remote cause of this inveterate disease, to which all horses seem to be predisposed. The poisoned air is also a powerful agent in the propagation of ophthalmia. To these may be added the too frequent use of stables which are totally dark, so that when the animal is suddenly brought to the light, the abrupt transition produces a spasmodic effect on the muscles and vessels of the eye, and will cause that excessive inflammation which accompanies this disease.

REMEDIES.—When this disease first makes its appearance, the inside of the eyelids should be freely lanced, which often has the effect of stopping the complaint. The horse should then be put upon a low diet, and gentle purgatives administered. Bleeding at the jugular-vein or temporal-artery has often proved beneficial in diseases of the eye.

When the cornea presents a cloudy appearance, bleeding and cooling medicines are the most likely to relieve it ; and then use some exciting means to give energy to the absorbents. For this purpose the eye should be washed with a weak solution of corrosive sublimate, viz., two grains of the sublimate to an ounce and a half of water.

If opacity of the lens has taken place, we are not aware of any means of removing it.

THE HAW.

It is no unusual thing for a thickening of this part to take place, and it will then protrude itself on the fore part of the eyeball. In this disease the retractor muscle pulls back the eye to protect it from the irritating effect of the light, and this thickening of the haw pushing it forward, and the adjacent parts being also thickened, no retraction can take place.

The practice of cutting out this is exceedingly absurd, and ought never to be resorted to. It is intended for protecting the eye against dust or insects. In former times few farriers understood the use of the haw; and even yet it is surprising how few are aware of its value to a horse. In cases of inflammation of the eye; it sometimes itself becomes inflamed and increased in dimensions, and the contiguous parts likewise thickened. This either forces it out of its place, or it is voluntarily produced to protect the eye from the action of light. In some cases it does not return into its place, and has been mistaken for a tumour or extraneous excrescence, and has been cut out by ignorant persons, and the eye consequently left unguarded. Bleeding, gentle physicing, and cooling applications will invariably effect a cure. The lotion pointed out at page 35 should be used.

In some instances, when the inflammation is long-continued, ulceration of the haw and destruction of the cartilage ensues. The above lotion ought first to be applied to it. Should this not stop the ulceration, then use the following:—

White vitriol	$\frac{1}{2}$ ounce,
Water	3 ounces ;

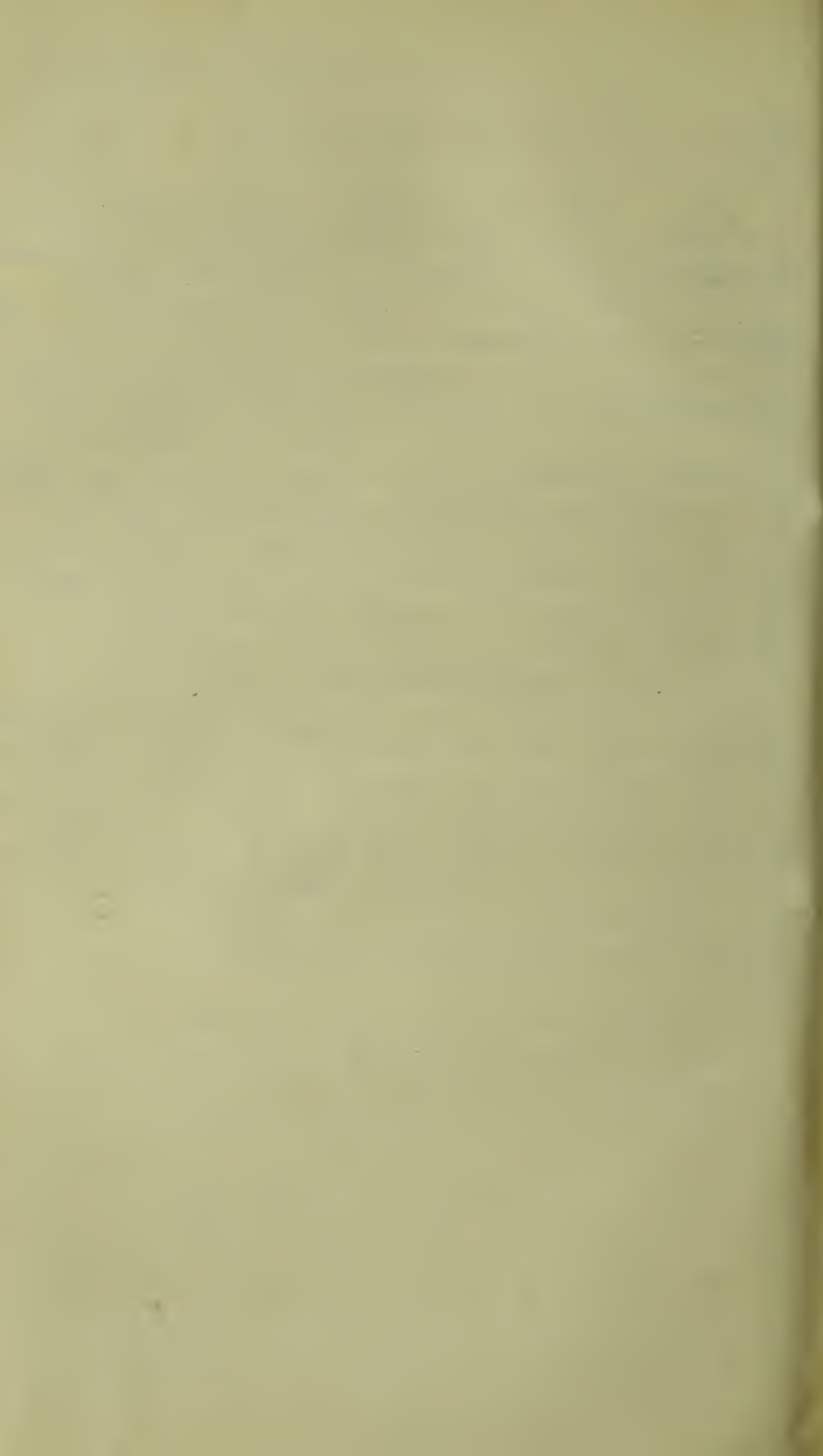
and if it becomes callous, a weak solution of nitrate of

19th March 59

Mr.

By: Cart Jilly brought to
College in Cart. Had never
thrown since its birth & was killed.
Post-mortem. Stomach full of
Sand. The sand being composed
of various half. Small intestine
full of tiny Lumbrici. Caecum
Caput Coli also full of Sand
& of very dark in colour.
Some of the Lumbrici were attached
to the mucous coat of the large
Colon but they were few & small
in size. The Hepatic duct
also contained a few.





silver should be applied to it. If this proves ineffectual, then it must be extirpated by a regular veterinary surgeon.

ERUPTION ON THE EYELIDS.

SYMPTOMS.—The edges of the eyelids are occasionally affected with scale-like eruptions. This is always attended with great itching, which causes the horse to rub his eyelid against any projecting part within his reach, in the performance of which it often happens that the animal injures the eye itself.

REMEDIES.—The edges of the eyelids should be anointed with the following :—

Nitrated ointment of mercury	$\frac{1}{2}$ ounce,
Hogs' lard	$\frac{1}{2}$ ounce,
Bees' wax	$\frac{1}{4}$ ounce.

A few applications will generally produce the desired effect.

WARTS.

The eyelids are sometimes affected with warts, which are very irritating to the animal in consequence of his rubbing them on some prominent part : this causes them to bleed, and increases their number.

They should be cut off with a pair of sharp scissors, and the roots touched with nitrate of silver, lunar-caustic, or blue vitriol.

GUTTA SERENA.

SYMPTOMS.—This exhibits itself by an extraordinary dilation of the pupil, which becomes immovable, and has a bright glassy appearance. This is caused by a paralysis of the optic nerve, or the surface of the retina, (or mirror of the eye,) occasioned by a determination of blood to the brain,

and its consequent pressure on the optic nerve or on the retina, and thus destroying its function.

CURES in this disease are very few in the horse. Bleeding, medicine, and the rowel have been mentioned as remedies ; but from the nature of the disease we have but little faith in them. Indeed we doubt if ever the cure of a confirmed case of gutta serena, or glass eye, has ever been effected. Bleeding, when determination of blood to the head is suspected, may prevent this malady ; but after the pressure on the optic nerve has produced the dilation, I consider the case hopeless.

GENERAL BLINDNESS AND IMPERFECT VISION.

No subject is of greater importance than the state of a horse's organs of vision, and ought to occupy the first attention of a purchaser ; for blindness, or a partial defect in the eyes, may lead to many unpleasant consequences to the proprietor, whether in riding or driving. It will require considerable knowledge of the anatomical construction of the eye to enable any one to judge correctly of its perfection or defects.

Independently of the beauty of a prominent eye, it is of much importance that the cornea should possess considerable convexity ; but this must have a limit. If very prominent, the rays of light will be too convergent, which will cause indistinct vision ; on the other hand, if the cornea be small and flat, the rays may not be sufficiently convergent, and consequently will render the vision imperfect. A horse is unsafe with either of these defects, both in riding and driving, as he is certain to start at objects which suddenly present themselves, or he may quickly bolt round, and in either case may over-balance the rider, or upset a vehicle.

The cornea should, therefore, be moderately convex, perfectly transparent, and totally free from all opacity or

Shouldered with its entire surface.
The best method of examining this organ
is to place the cheek of the Scrotum

cloudiness over its entire surface. The best method of examining this organ is to place the cheek of the scrutinizer close to the cheek of the horse, both behind and under the eye, and the latter position is the most advantageous to see it thoroughly. The open air is not favourable for such an examination. The head of the horse should be a little within the doorway of a stable, and by looking outwards any defect is rendered more visible. If any faint whitish, milky-like streaks be noticed passing over the cornea, it is certain the animal has had inflammation in that portion of the eye. But, should the centre part of the cornea be perfectly transparent, and yet the margin of it, where it unites with the sclerotica, have a hazy ring, it may be concluded that this has been occasioned by recent inflammation, and consequently the eye will be predisposed to a return of it.

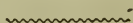
During the operation of thus inspecting the eye, no white or pale-coloured object should be near, as its form and great transparency are very likely to reflect these rays, and may deceive the person examining the organ.

Attention to the dilation and contraction of the pupil will materially aid a person in the detection of blindness or otherwise. When the cornea and crystalline lens are quite transparent, with the retina paralysed, and of course not liable to be affected by light, blindness in one or both eyes will be extremely difficult of detection. It generally happens, when a horse is totally blind, he has a constant and rapid motion in his ears. He also lifts his feet high, as if some obstacle presented itself, and he puts his feet to the ground with a cautious uncertainty. Particular attention should be directed to the pupils of both eyes, and to noticing whether they are both of a size while he is in the stable; and as he approaches the door, observe whether both pupils contract equally as they are subjected to the stronger

light. If, however, the horse is examined in the open air and distant from a stable, place the hand over one eye, and then observe, after it has obscured it from the light for a little while, whether the pupil contracts. Repeat the same experiment with the other eye also.

FRACTURE OF THE SKULL.

The admirable construction of the skull of a horse, as will be seen in our anatomical description, renders a fracture a thing of rare occurrence. And such is the force required to produce such an effect, that it almost invariably proves fatal by injuring the brain. Horses that rear, and in that act fall, sometimes fracture their skull, and in some instances blows inflicted by their grooms with a heavy weapon may have the effect of fracturing the skull. There is little hope of a cure, except with the assistance of a regular veterinary surgeon. But in case one is not to be had immediately, the parts of the bones should be replaced and held together by the aid of adhesive plaster. Bleeding and low feeding must be resorted to, together with small doses of medicine.



CHAPTER II.

DISEASES OF THE NECK AND CONTIGUOUS PARTS.

POLL-EVIL.

SYMPTOMS.—This disease consists of an inflammation of the muscle over the poll-bone and the first vertebra of the neck. It generally extends under the ligament of the

neck which passes over the atlas-bone. This ligament is not attached to the bone, and the disease is consequently seated between it and the bone itself. It is being thus deeply seated which frequently renders it so difficult to cure. Before the swelling becomes very conspicuous, the part is very hot, and painful when touched, which can easily be noticed from the motion of the horse.

CAUSE.—The poll-evil is too frequently occasioned by a severe blow on the poll of the neck, given by ill-tempered and unmerciful riders or grooms ; at other times it is brought on by the horse striking his head against the manger, or by the ligaments being too much stretched by severely tight reining. But, from whatever cause the malady proceeds, it frequently becomes exceedingly troublesome and tedious to cure.

REMEDIES.—Before suppuration takes place, every means should be adopted to suppress the inflammation, and, if possible, to disperse the swelling. Medicines of a laxative kind should be administered, and bleeding resorted to, and also cold lotions applied. This treatment will often have the effect of reducing the tumour. But if it is found that the swelling continues in spite of these, other means must be resorted to, and applications to facilitate the ripening of the tumour must be adopted. This will be best effected by poultices, warm fomentations, and stimulating embrocations. Care must, however, be taken not to allow suppuration to ensue of its own accord. The progress of the disease must be narrowly watched, and when sufficiently advanced, which will be known by the softness of the tumour, it must be opened with a lancet, and afterwards kept open by means of a seton. The needle, with the cord attached to it, must penetrate the apex of the ulcer, and be forced out a little way below the bottom of the abscess, so that no matter

can possibly collect in and lodge there. Gentle pressure should be used to squeeze the whole of the matter out. After this nothing more will be required except to keep it clean and occasionally fomented with warm water. If taken at an early stage of the disease, what we have recommended will generally effect a cure.

On the other hand, should the ulcer spread and deepen and affect the ligaments of the vertebræ of the neck, the edges of the wound must be stimulated by nitrate of silver or caustic, to induce a healthy action into the muscular fibre, and excite it to granulate. When the interior of the abscess has assumed a callous appearance, it may be necessary to syringe it out with a very weak solution of nitrate of silver mixed with rose-water. Should this not have the effect of inducing a healthy condition, then it will be necessary to have the services of a regular veterinary surgeon.

It is sometimes requisite to divide the ligament which passes over the occipital bone, in order to expose the interior of the abscess to the action of caustic applications. But no danger to the horse will result from this, as perfect re-union of the divided ends of the ligament will take place in two or three days.

The cord used as a seton should be wet with the following mixture :—

Corrosive sublimate . . .	$\frac{1}{2}$ drachm,
Spirit of wine . . .	2 ounces.

The cord should be cut off and united at both ends by wrapping a thread round it, and pulled round several times during the twenty-four hours, taking care to wipe the part which has been in the abscess, and also to wet the portion which is to remain in it for a time, with the above solution.

When all the swelling has subsided, and the tumour becomes flattened, and the matter assumes a thick white appearance, the seton may be removed, and the ulcer dressed with the following ointment :—

Digestive ointment	.	.	$\frac{1}{2}$ ounce,
Nitrated ointment of mercury,			$\frac{1}{4}$ ounce,
Bees'-wax	.	.	$\frac{1}{4}$ ounce.

The wound should be washed with a lotion composed of

Muriate of mercury	.	.	$\frac{1}{2}$ drachm,
Lime-water	.	.	6 ounces.

ROARING.

SYMPTOMS.—This is a disease arising from an affection of the larynx and superior portion of the windpipe. When a horse so affected has been hard trotted or galloped, he may be heard at some distance to utter a grunting sound. Or when he is standing, if touched suddenly in the loins with a whip or stick, he will involuntarily grunt or groan. Dealers are frequently in the habit of practising this test ; because, if a horse is moderately exercised or at rest, this complaint never manifests itself.

CAUSE.—It is supposed to be produced by a thickening of the larynx and upper portion of the windpipe, in consequence of previous inflammation, and thus obstructing the passage and limiting its action. After strangles this disease frequently follows. Tight reining is also a common cause of this evil. By this the action of the larynx and superior muscles of the windpipe are circumscribed, and ultimately become semi-paralysed, with consequent loss of power and action ; therefore, the opening not being sufficiently capacious during the rapid breathing occasioned by violent exercise, the pressure of the air rushing through the circumscribed space, the sound is produced which has been absurdly termed

“roaring.” The practice of what is termed *coughing* a horse, to ascertain the state of his wind, is apt to produce roaring. This is performed by subjecting the larynx or trachea to violent pressure by squeezing with the fingers. A horse so afflicted may be considered as decidedly unsound.

REMEDIES.—Should this disease be occasioned by previous inflammation, and a thickening of the parts have ensued, bleeding may be resorted to with some little effect ; but if from compression, produced by what we have hinted at, there is no possibility of remedies having the slightest effect. After bleeding, purgative medicines, which have a tendency to diminish the circulation, should be had recourse to. The following may be tried :—

Digitalis	.	.	.	1½ drachm,
Nitre	.	.	.	2 drachms,
Emetic tartar	.	.	.	1 drachm,
Aloes	.	.	.	1¼ drachm.

Blisters have been tried, and not without apparent success. When the disease has been of such a character as to threaten suffocation, the part supposed to cause the difficulty of breathing by obstructing the passage of the air has been cut down upon, and a portion of one of the rings cut out ; and others have introduced a breathing tube.

OBSTRUCTION OF THE GULLET.

SYMPTOMS.—In this malady the gullet has become contracted, which compels the horse to swallow its food in small quantities, and that with much difficulty, giving the animal the appearance of choking when in the act of swallowing. Sometimes the stricture is near the upper portion of the gullet : in which case an experienced veterinary surgeon

may devise some remedy ; but if seated near the entrance into the stomach, little hopes can be entertained of a cure.

Horses eating too greedily sometimes swallow their food in too large masses, and before it is properly masticated, which has in many instances lodged in the gullet, producing alarming symptoms of suffocation.

REMEDIES.—The first thing to be tried is to force the ball of food which obstructs the passage downwards, by the aid of the elastic tube used for the hove in cattle. Sometimes it cannot be dislodged even by means of this instrument. In that case the only other remedy is to cut open the gullet to prevent suffocation. But this operation need not be described, as it can only be successfully performed by a veterinary surgeon.

INFLAMMATION OF THE JUGULAR VEIN.

In the horse the jugulars are single on both sides of the neck, while in horned cattle they are double. Inflammation is sometimes induced in them after the operation of bleeding, directions for which we shall give hereafter.

After bleeding has been performed, the practice is to bring the cut edges of the vein together, and to keep them in contact by inserting a pin through the skin above it, and twisting tow pretty tightly round it, so as to keep it from being removed. In a couple of days the wound will have completely healed in most cases.

CAUSES.—A variety of causes may, however, operate to induce inflammation of the vein. Among these may be enumerated striking too hard on the lancet with the fleam, (an instrument used in bleeding,) or using a blunt or rusty lancet. In other cases, by pulling the skin too far from the neck while drawing the wound together, and thus allowing

space for the blood to insinuate itself into the cellular tissue ; or working the horse immediately after the operation ; or neglecting to tie up his head for a short while after bleeding to prevent his removing the pressure of the pin from the wound, by rubbing his head against the manger ; and other causes.

SYMPTOMS.—The edges of the wound having separated, or being ragged, from the clumsiness of the operator in not penetrating the vein at the first blow, become swelled and inflamed, and discharge a thin fluid of a bloody appearance. In a day or two this will put on the form of matter. Inflammation to a considerable extent may ensue, with swelling of the muscle, and the vein will become hard, and feel like a cord, and increasing upwards, the contiguous parts will feel very hot. This is generally followed by a series of small abscesses over the seat of the wound. The cordiness of the wound gradually increases still further upwards ; and from the inflammation also following that direction, it frequently proves fatal to the horse.

REMEDIES.—Some veterinary surgeons, to stimulate the part, apply a hot iron to the margin of the orifice, which induces a union of its edges. Should this not prove effectual, and if the swelling is great and the abscesses have made their appearance, the next remedies are to inject a weak solution of nitrate of silver or other caustic liquid into the abscesses, or to introduce setons into them ; and should this fail, he should cut out the diseased portion of the vein.

This operation will not be attended with any bad consequences ; for all the blood-vessels, whether veins or arteries, communicate with each other either directly or indirectly, in so many different ways, that an injury sustained by a portion of them is compensated for by the current of the blood

flowing in another channel, which, although not so direct in its course, will not retard the necessary progress of the circulation.

CHAPTER III.

DISEASES OF THE CHEST AND ITS CONTENTS.

INFLAMMATION OF THE LUNGS.

SYMPTOMS.—Of all the diseases incidental to the horse, that of inflammation of the lungs is the most prevalent, and certainly the most fatal. Sometimes this malady is sudden in its appearance, but in the greater number of cases fever is a premonitory symptom. In its early stages it is not very rapid, but is indistinct and heavy in its action, feeling vibratory under the pressure of the finger. In other instances it is hardly to be perceived, so languid is its motion. This is followed by dilated nostrils, coldness in the extremities, and heaving in the flanks, which clearly indicate an oppression in the breathing; differing, however, from the laboured and hard action of the lungs in fever, and also the irregular breathing in broken-winded horses, which appears as if it required two expirations for every inspiration of air into the lungs. In inflammation the pulse is quick, hurried, and irregular, caused by the pain which is felt by the animal at each attempt to draw in the air, giving the appearance of something being imperfect in the respiratory organs. The animal thrusts out his head, the mucous membrane of the nose becomes very red, especially in the inside angles of the nostrils, where it continues; although at times it extends further up, from which position it may disappear, but still maintaining its chief seat in the lower portion of

the nostrils. The animal expresses great anxiety in his look, and turns his head frequently and hurriedly round towards his flanks, more especially to that side where the inflammation has settled. He stands in a straddling manner, with his fore legs generally considerably apart. He seldom lies down, and when he does so it is but for a few minutes, remaining for days on his legs.

It does not, however, always happen that the premonitory symptoms are the same, for in many cases inflammation comes on slowly and in an insidious manner. Perhaps the horse may be off his feed and his coat will stare; his breathing may be but slightly accelerated and abbreviated, with the legs a little colder than usual. Sometimes inflammation of the lungs is preceded by symptoms which are attendant upon common fever, catarrh, or the distemper. In such instances the true disease manifests itself in its full force when the groom or master of the horse least suspects it. The first manifestations are coldness in the limbs and ears, accompanied by the flurried pulsation and anxious look, with a seeming dread of lying down. This is soon followed by an irregularity and indistinctness in the pulse, and extreme coldness affects the legs and ears. The nostrils become livid—he hardly seems to breathe—he grinds his teeth—and these may be regarded as the too certain symptoms of dissolution; staggering ensues, and he finally sinks in his stall.

This last is a picture of that kind of inflammation of the lungs which has lurked in the constitution without exhibiting premonitory symptoms, and which in most cases proves fatal. There are, besides, cases in which the disease is so rapid that it will have undergone its entire stages in twenty-four hours. In this short time the entire mass of the lungs will have suffered complete destruction. Such a case has been satisfactorily proved not to proceed from long and

deep-rooted inflammation, but assuredly from the very reverse. It has been caused by an extraordinary degree of inflammation bursting the coating of the vessels and filling the air-cells with blood, and having thus instantly destroyed their functions.

There are bad cases, which are not so rapid in their termination, but which are nevertheless equally fatal. This happens when no rupture in the vessels has taken place; and although means have been adopted to take off the pressure of the inflammation, yet these have been insufficient to produce the desired effect. In such a case the breath of the horse will be extremely disagreeable, with a running at the nostrils, which is a sure indication that mortification has taken place in the substance of the lungs, and that death will soon follow.

Inflammation of the lungs will be distinguished from inflammation of the bowels, by the pulse in the latter case being small and wiry; the mucous membrane of the nose not being so red, and by pains in the belly, which are indicated by kicking, pulling, stamping, &c.

CAUSE.—This malady is brought on by the numerous and sudden transitions from heat to cold, to which most horses are subjected. They are, under the careless and wanton folly of masters and grooms, often galloped, or otherwise worked and overheated, and then permitted to cool in the open air, or in the draught of a stable. The stable itself is also kept too hot, frequently from twenty-five to thirty degrees beyond that of the atmosphere; and its air is but too often of an impure kind, and which being breathed affects the membrane which lines the cells of the lungs. This is weakened, and hence rendered susceptible of irritation and inflammation from breathing an atmosphere which is impregnated with ammoniacal gas, generated by the manure and urine.

REMEDIES.—The treatment for inflammation of the lungs must be immediate and decisive. As the disease is rapid, so also must be the means employed. Although its first symptoms may exhibit a mild character, yet we have seen how rapid they become in their after effects. To palliate it therefore would be absurd. Ample bleeding must be resorted to ; but the quantity of blood taken cannot be specified, we must therefore look to its effects. He should be bled until his pulse begins to rise, and afterwards until it flutters, and the horse even faints from exhaustion. During the flow of the blood the pulse should be felt all the while to mark its progress. Five or six hours afterwards the horse should be examined, and if he still exhibits the symptoms of the complaint, viz., quick and laborious heaving of the loins, a stiffness in his attitude while standing, great coldness of the feet and redness in the membrane of the nose, bleeding must again be resorted to, and as amply as before, even until it is followed by the same state of exhaustion. Such treatment will generally have the effect of putting a stop to the disease ; although in obstinate cases even a third repetition may be necessary, but not to the same extent as before, as an exhaustion of the system may follow, and prove fatal to the animal. It is surprising how soon the blood which has thus been taken away will be restored. If after all this the cold symptoms still continue, it may be proper in two or three hours to take from one to two quarts of blood, so as if possible to rouse the action and prevent the inflammation from again returning.

The state of the disease can be pretty well ascertained from the thickness of the blood and the buffy, orange-coloured appearance of the surface some hours after it has cooled and congealed.

Should we have so far succeeded in mastering the com-

plaint, our next attention must be turned towards the general condition of the system. If the horse be costive, which is frequently the case in inflammation of the lungs, from four to eight ounces of Epsom salts, mixed with a gruel, will be found useful, and we must next have recourse to blistering, which should extend over the brisket and sides. And if there is any doubt as to the eradication of the disease having been effected, the following ball should be administered every day :—

Soccotrine aloes	.	.	4 drachms,
Tartarized antimony	.	.	3 drachms,
Saltpetre	.	.	$\frac{1}{2}$ ounce,
Powdered squills	.	.	1 drachm ;

to be formed into a ball, with a sufficient quantity of conserve of roses.

In blistering, the hair should be carefully shaved off, and the following ointment well rubbed into the skin :—

Powdered Spanish flies	.	.	1 ounce,
Resin	.	.	1 ounce,
Lard	.	.	4 ounces.

Let the lard and resin be first mixed together, and the Spanish flies afterwards added.

During the time that the inflammation is at its height the blister will seldom rise, the internal excitement overcoming the external one ; and a failure in its operation also accompanies exhaustion. In this case there is danger to be apprehended. When the inflammation has been brought down by bleeding, it is the most proper time for the application of a blister, which produces a counter irritation, and thus transfers the inflammation from the lungs to the skin

Cooling medicines must now be resorted to, and the following doses may be given until an intermediate state of the pulse is induced :—

Nitre	3 drachms,
Emetic tartar	1½ drachm,
Digitalis	1 drachm.

This medicine is persisted in until the horse hangs his head and becomes half stupid, with a flow of saliva from his mouth. In less than twenty-four hours after this condition has been effected the disease will be found to have completely subsided.

It is a great mistake to suppose that in this complaint the stable should be kept very close and warm; for the very cause which in a great measure operated in remotely inducing the disorder is again brought into play. Rather let warm clothing be put upon the horse, which will have a tendency to keep up insensible perspiration.

After this the horse should be well rubbed down, and his legs in particular should have a smart application of the brush, in order to restore heat and an increase in the circulation, and then thickly rolled up with flannel to keep up the action. The rubbing should be repeated from time to time. The less he eats at a time the better. Corn must on no account be given. Green food and cold mashes may be set before him in small quantities.

If the oppression in the breathing now subside, heat be restored to the limbs, and the animal lie down, these are sure indications of the symptoms having abated. The strength and appetite will now gradually be restored. But much caution should be exercised in not allowing the animal to take too much food, which might have the effect of inducing a return of the malady : green meat, or, if that cannot be had, a gruel of oatmeal, cold mashes, and a little hay should form his diet. But to restore strength where

much exhaustion prevails, tonics should be given. The mildest should first be administered, and this is camomile, in doses of from one to two drachms. Afterwards—

Camomile	.	.	.	2 drachms,
Ginger	.	.	.	2 drachms,
Gentian	.	.	.	2 grains.

Should the animal continue to improve, his diet may be extended, and probably in three or four days he may have a small quantity of corn, which may be increased as his strength is restored.

A cool and clean stable are the best means for preventing predisposition to diseases of the lungs, both of which should be scrupulously attended to. The heated air of a stable, and the poisonous gas arising from the dung, prove most injurious to the horse.

LOCAL INFLAMMATION.

SYMPTOMS.—The symptoms of local inflammation are redness of the parts, heat, pain, and swelling.

CAUSES.—The redness is induced by the increased flow of blood through the vessels of the part affected, in consequence of an increased action of the blood-vessels. The heat arises from the change gradually taking place in the flow of blood, passing from the arterial to the venous condition. So that if more blood be propelled through the capillaries, more heat will consequently be produced in that situation. Swelling is induced by the same means as the redness, namely, from a fluid being deposited in the contiguous substance; and pain must be the effect of distention and pressure produced, and the consequent disarrangement of the nerves of the parts affected.

REMEDIES.—Inflammation of every kind is caused by an increased flow of blood through the vessels of the part

inflamed ; consequently the remedy must be to reduce the circulation to its ordinary and healthy action. Bleeding is the first remedy to be tried, and, if possible, from a vein close to the inflamed part. But if none of the larger vessels are situated near it, then the jugular vein must be resorted to. If the inflammation is in the eye, the gorged vessels should be scarified, which will prove more effectual than bleeding from the jugular ; or a quart of blood taken from the foot in Acute founder will do more good than four times the quantity taken from the jugular. But whatever part is affected, or from whatever cause, let bleeding be immediately resorted to as the only sure means of checking inflammation ; and although it may not remove it entirely, yet it is certain to mitigate its violence. From neglecting this most important remedy at an early stage, many horses have been lost ; and also from over-caution in taking too little at a time. Four quarts from so large an animal may be removed without hesitation ; and where the inflammation is great, the stream of blood should flow rapidly. To effect this a broad-shouldered lancet should be used, so that the wound in the vein may be ample. In whatever situation therefore the inflammation occurs, let the bleeding be immediate and plentiful.

After bleeding purgative medicines must next be had recourse to, because the mucous membrane of the bowels and coating of the stomach are in most instances affected sympathetically by a deranged action in any other part of the system. But should this not be the case, they may be otherwise irregular, which invariably increases all kinds of inflammation, and fever is induced, more especially where there is much retention. Purging has the effect of lessening the quantity of the blood, by removing from it the serous or watery portion ; and, by determining the blood to

the bowels, the pressure is necessarily removed from the inflamed vessels. As it is a law of the animal economy that where the circulation is directed to one set of vessels it proportionally diminishes the flow in other parts of the system, purging, by producing langour and sickness, lessens the general excitement, and hence the pressure upon the circulation is circumscribed.

In administering medicine in cases of internal inflammation much caution and consideration are required, because what might be beneficial in some cases may be prejudicial in others. Purgatives in inflammation of the lungs and bowels ought never to be administered until the inflammatory symptoms have been removed, as there is such a strong degree of sympathy between the various organs enveloped in the cavity of the chest, that they are apt to be influenced by that which affects any of them, more especially if the inflammation is violent.

EXTERNAL INFLAMMATION.

Great difference of opinion prevails on the means of treating external inflammation. Cold embrocations and lotions were considered as the most proper remedies to be employed in this disease, being more likely to allay the heat of the part; and there can be little doubt but they will speedily lessen the heat from the well-known principle, that caloric has a strong tendency to equalize itself, or to quit any substance which is surcharged with it; consequently, by these appliances the increased temperature is diminished in the part which is inflamed. The effect will be considerably heightened by dissolving two ounces of nitre in a quart of water, and applying it immediately after the nitre is fairly dissolved, the inflamed portion being completely exposed to the process of evaporation. Nitre will

lower the temperature of the water many degrees below its natural condition. But it is questioned whether permanent benefit is derived from cold applications in cases of inflammation.

Warm fomentations, although not so grateful as cold ones to hot swellings, will, however, be found to produce better results ; as they open the pores of the skin, and if applied as hot as the animal can endure it, will more readily take off the tension produced by inflammatory swellings. Poultices will have the same effect. These should be made of lintseed meal, with a little butter or lard spread over the surface, which will keep it moist for twenty-four hours. Blisters have also been successfully applied in deep-seated inflammations ; for, by creating inflammation on the surface, on the principle of counter irritation, it will have the tendency to lessen it in the other part, as great inflammation cannot exist in two parts near to each other. In inflammations of the chest, blisters will be found of much benefit. But these should never be applied to parts which are already inflamed.

PLEURISY.

SYMPTOMS.—This disease is entirely confined to inflammation of the pleura or membrane which lines the chest, and hence its name. It has no connexion with the substance of the lungs. The pulse is hard, but not oppressed. The extremities are cold, although not so much so as in ordinary inflammation, nor is the membrane of the nose so very red. If pressure on the sides is applied, the horse will feel pain, and express it by a quick and impatient grunt. The unwillingness of the horse to lie down will be manifested in this as well as in violent inflammation of the lungs.

CAUSE.—This disease has its origin from the same causes as inflammation of the lungs, viz., sudden transitions from heat to cold, &c.

REMEDIES.—Immediate and copious bleeding is the first thing to be resorted to ; and afterwards sedative medicines, administered in the form of gentle purgatives, which may be given with more safety than in inflammation of the lungs and ordinary inflammatory cases.

If pleurisy is violent, it frequently induces dropsy in the chest, as in this complaint a fluid is thrown out from the vessels of the pleura, which, having no means of escaping, lodges in the cavity of the chest. When this is the case little good is to be expected from the animal, and it seldom happens that a complete cure is effected. Sometimes the chest is punctured for it, which may carry off the fluid ; but it too frequently proves an ineffectual remedy. Whenever it is suspected that water is formed, puncturing should be had recourse to, the opening to be made by the instrument called the *trochar*. The locality where it is inserted is the intercostal membrane, between the seventh and eighth ribs, and as close to the cartilages as possible. Diuretic medicines, in combination with tonics, should be given. The following will be found the best :—

Turpentine	.	.	.	$\frac{1}{2}$ ounce,
Ginger	.	.	.	$\frac{1}{2}$ drachm,
Lintseed meal	.	.	.	$\frac{1}{2}$ ounce ;

made into a ball with common syrup or treacle.

Some persons consider the following better :—

Powdered resin	.	.	$\frac{1}{2}$ ounce,
Ginger	.	.	$\frac{1}{2}$ drachm,
Lintseed meal	.	.	2 drachms ;

made into a ball with palm-oil.

When attended with any degree of fever, the following should be administered twice or thrice a day instead of the above :—

Digitalis	.	.	1 drachm,
Nitre	.	.	3 drachms,
Emetic tartar	.	.	1½ drachm.

FEVER.

SYMPTOMS.—Fever commences with a cold and shivering fit ; the animal manifests great dullness, with a desire to be inactive ; his hair stands erect, or stares, and his legs and feet are cold ; the pulse is quick, hard, and unequal ; his mouth is hot, with a total loss of appetite, shivering, and a dejected appearance. This is followed by general warmth of the body ; an unequal distribution of heat to the limbs, sometimes one being hot while the other is cold. He becomes very costive, with turbid urine ; affected sometimes with colic pains ; but there is no cough, pawing, or looking back at the loins. If these symptoms are allowed to proceed unchecked, the membrane that lines the eyelid becomes unnaturally red ; the inflammation may then be considered as settled in some internal organ, and pure or symptomatic fever will have ensued. While this pure fever continues, the shivering fit returns daily, at nearly the same hour, and is followed by a warm one, and sometimes by a cold clammy sweat. This state continues for several days, and local inflammation ensues ; or the fever gradually becomes abated.

Some veterinary surgeons have absurdly denied the possibility of fever in the horse, but those who have advanced such an opinion must have paid but little attention to the state of his pulse.

CAUSES.—General increased action in the heart and arteries

is the cause of fever, produced by the sympathy of the system, induced by local inflammation ; or it may exist without any perceptible local affection. It is too frequently induced by bad stable management, the sudden changes from heat to cold, and the lungs having breathed impure air from the filth and confined atmosphere of the stable. Symptomatic fever is caused by increased action of the arteries. Inflammation of the lungs, feet, or any other part of the body is generally accompanied by fever.

REMEDIES.—The same general treatment which we have recommended in local inflammation will apply to simple fever. Bleeding until an impression is made upon the system, while the finger of the operator or an assistant is held upon the artery to mark its effects. Gentle purgatives will be found beneficial, but strong ones exceedingly injurious. The following must be given morning and evening :—

Digitalis	.	.	.	1	drachm,
Nitre	.	.	.	2	drachms,
Emetic tartar	.	.	.	1	drachm,
Aloes	.	.	.	1½	drachms.

When the costiveness has yielded to the above, then the aloes may be discontinued. The above may be slightly augmented or diminished, according to circumstances. Should they, from frequent repetition, fail to produce the necessary effects, which will sometimes happen, then half-a-drachm of white hellebore may be given twice a day.

Symptomatic fever should be treated in the same manner as simple fever, only that attention must be directed to the diseased part which caused the fever. If the inflammation can be subdued, then the fever will naturally abate, without other means being adopted.

STOMACH-STAGGERS.

SYMPTOMS.—This disease is indicated by the dull, stupid, sleepy appearance of the horse, and he staggers about in his stall. He seems unconscious of what he is doing, and if roused from his lethargy will probably take a mouthful of hay, in a few seconds desist from chewing, and the hay will fall from his mouth. Many instances have occurred, when the disease has been allowed to acquire an ascendancy, that the horse would drop down and die while in the act of eating. In other cases the drowsiness goes off, and is succeeded by delirium; and after falling, rising, and staggering about, will die in convulsions. The stomach-staggers are indicated by a twitching in the breast, and a yellowness in the eyes.

CAUSE.—Over-feeding is too often the cause of this sad disease, and especially if the food is of a bad quality. Careless servants will too often neglect a horse; and afterwards, by food being placed before him while ravenously hungry, he will swallow it rapidly and in too large quantity, without being properly masticated, consequently it swells in the stomach, and thus stretches it far beyond its natural capacity: its action is thereby impaired; the consequence is, the brain is unduly acted upon, and giddiness and drowsiness induced, which occasion staggering. Besides the horse being allowed to eat in this manner, the groom may neglect to give the animal water to assist it in converting it into a pulp and facilitating the operation of digestion, the natural juices of the stomach, from its gorged state, being inadequate to the performance of their office.

REMEDIES.—Before remedies are attempted it must first be ascertained what has caused the staggers; as the mad staggers present exactly the same symptoms in their early

stage. In this disorder, as may well be supposed, medicine will have but little effect, from the gorged condition of the stomach. Some veterinary surgeons recommend bleeding; but we have never found this attended with any beneficial effects, as what must naturally debilitate the system can hardly be expected to aid the action of the stomach. Probably the safest plan is to allow nature to work its own cure, by abstaining from giving food. But as we know of no certain remedy for this disease, we should carefully guard against promoting it.

It is no uncommon occurrence for farmers and others keeping a number of horses to lose several of them within very short periods of each other with this malady, from which an opinion prevails with many that the staggers is contagious. Nothing can be more erroneous than this belief, as it is quite certain that the complaint is induced by bad stable management, or by feeding the horse with unwholesome food, or in the horse feeding too voraciously, as already mentioned. This disease is more common with old horses than others. We would strongly recommend the owners of horses to give some attention to the following :—Too much food given at one time after long fasting or hard work, and neglecting to give the animal water, is almost certain to produce the staggers. The hours of labour should be for limited spaces of time, with proper intervals of rest allowed, and the horse regularly fed during these intervals. Every man must have felt the effects of being without dinner for two or three hours beyond his accustomed time. Exhaustion is almost certain to follow, which is produced by the gastric juice acting upon the coating of an empty stomach. From five to six hours are the intervals between the meals of a labouring man; and with a horse that is worked no longer time should be allowed to elapse without feeding and

watering. When persons are occasionally so situated that they cannot unyoke their horses at stated times for food and rest, then they ought to carry hay and a nose-bag, and a supply of corn along with them. Indeed, it is surprising that if humanity does not influence many men to be kind to this valuable animal, self-interest ought to have the effect of inducing proper treatment.

Staggers often attacks horses while they are at grass. This, however, happens chiefly with such as have been previously stinted in their food, or where the pasture is very rich. In such cases, nature generally works its own cure ; because, if the horse is kept from eating, the natural sap in green food will soon assist in promoting digestion. Horses that have frequent attacks of staggers are very liable to have their sight impaired by it. Indeed we have known instances of total blindness from this cause.

CATARRH, OR COMMON COLD.

The sudden transitions from heat to cold to which horses are so frequently, and often so thoughtlessly, exposed, renders this a very common complaint with them. If masters and servants would bear in their remembrance the old and true adage "that it is better and easier to keep well than to make well," their horses would not require half the medicines which are given to them.

A simple cold, if neglected, may end in an incurable disease, especially with horses of a delicate constitution. Catarrh commences with a slight degree of fever, with some little discharge from the nose and eyes, accompanied by cough, which is sometimes hard, frequent, and painful to the horse. When this is the case, bleeding will be necessary. But if the cough is not severe, the complaint may generally be removed by simple treatment. The horse

should be kept warm, and a few doses of the following mixture administered :—

Digitalis	.	.	.	$\frac{1}{2}$ drachm,
Nitre	.	.	.	2 drachms
Emetic tartar	.	.	.	1 drachm ;

to be given in the form of a ball. Instead of corn, his food should consist of hay and mashes.

BRONCHITIS.

SYMPTOMS.—Inflammation of the bronchial tubes manifests itself by the breathing being considerably harder and quicker than in a common catarrh ; and also by a wheezing sound accompanying the inspirations of air into the lungs, and which is temporarily removed when the horse coughs up the mucus secreted by the inflamed membrane of the throat.

CAUSE.—Bronchitis is generally induced by a severe cold, and is indicated by the cough being severe. The seat of the disease is in the divisions of the trachea, or wind-pipe, just before it enters the lungs. At this portion it branches out into a numerous series of vessels, and these are denominated the *bronchial tubes*, and hence the inflammation which attacks their lining has been called bronchitis. This disease is generally induced by catarrh having gained an ascendancy, and the inflammation extending to the entrance of the lungs.

REMEDIES.—Moderate bleeding must be resorted to, as too much taken in this complaint would prove injurious. Blisters on the chest should also be applied, and the following medicine given :—

Digitalis	.	.	.	1 drachm,
Nitre	.	.	.	3 drachms,
Emetic tartar	.	.	.	$1\frac{1}{2}$ drachm.

When bronchitis is neglected, it produces thick wind, which can never afterwards be removed.

THICK WIND.

SYMPTOMS.—Thick wind is indicated by short, laborious, and frequent breathings when the horse is at rest, and becomes much more evident where he is employed in working, whether in a cart, carriage, or as a hunter or roadster. In the latter cases, the inspirations and expirations succeed each other in such rapid succession that lead us to suppose the animal is about to expire through suffocation, and his breathing can be heard at a considerable distance; his sides and loins exhibit marked symptoms of the difficulty with which he breathes.

CAUSES.—This affection for the most part owes its origin to previous inflammation, and more especially from inflammation of the bronchial tubes. While this is the case the vessels exude a fluid, which coagulates, and is lodged in the substance of the lungs or in the bronchial tubes themselves, and the inflammation accompanying the complaint naturally circumscribes the dimensions of many of the air-cells, and totally closes up others; which must of consequence lessen the capacity of the lungs for the reception of air, and render it necessary to breathe more rapidly to compensate for the limited space. This will be increased as the animal is put in more rapid motion.

In morbid affections of the lungs of horses, the air-cells have been found completely filled with matter of a thick, greyish, or bluish colour; in other cases the tubes or passages communicating with the air-cells have been found nearly invisible from the thickening of their lining, and sometimes entirely covered with a hard, waxy mucus. Other instances have occurred where the internal lining of the cells them-

selves have exhibited traces of having been in a high state of inflammation, which must have occasioned great pain to the animal when breathing, and consequently have induced it to limit as far as possible the extent of the inhalations.

Certain conformations of the chest predispose horses to this complaint. Those with a round chest are liable to be affected in the wind, and especially if they are fat. Large draught-horses are nearly all thick in the wind, as well as all which are hard worked while their stomach is full. All inflammatory affections of the lungs produce thick wind while the malady exists, and frequently leave it even when removed. Glanders are too often the remote cause of thick wind; as the seat of this disease is so contiguous to the lungs and their air-passages, they soon become affected, and the air-cells are almost certain to be injured.

Horses with a circular chest are less liable to this complaint than those of a more contracted form. Those which have been kept much in a stable, and without being regularly exercised, will manifest symptoms of thick wind when trotted or galloped. But if they are cautiously trained to this action to which they have not been accustomed, then this will wear off, and they may be ridden without being in the least affected in the wind.

REMEDIES.—This disease does not come within the scope of medical treatment: all that can be done is to guard against overloading the stomach with heating food, and not to exercise the animal to any extent while his stomach is full. Abstain from subjecting him to hard labour, or trotting and galloping him violently. By these precautions the affection will gradually subside, and in time he may become perfectly sound.

BROKEN WIND.

SYMPTOMS.—A marked distinction prevails between this disease and thick wind. In the latter the inspirations and expirations are of uniform length and duration ; while in broken wind, for one inspiration two expirations are required, which is plainly indicated by the motion of the flanks. This is caused by the rupture or union of several of the air-cells, which renders the cavities of the lungs more complicated, and hence requires that double action to clear off the carbonized air. It may be easily conceived that when the lungs are expanded the air will rush in readily enough, and one exertion of the muscles of respiration is sufficient to expel the carbonized air ; but when these cells have become united, the cavity of the lung is so irregular and many-cornered, that air is with difficulty expelled from them, and therefore two efforts are required to effect it.

Broken wind is generally accompanied by a hard, dry, husky cough, differing completely in its character from that of a common cold.

CAUSES.—This disease may take place without any visible disordered condition in a horse. Voracious feeding may produce it, or food taken hastily and in too large quantities into the stomach, particularly coarse hay and straw, which, by distending the stomach beyond the natural limits, presses against the lungs and prevents their free action. Coarse and bulky food being frequently used, is extremely apt to produce broken wind, from the effect just mentioned. The constrained action of the lungs, from the frequently distended stomach, is apt to burst the air-cells, and thus lay the foundation of an incurable disease.

This complaint may, however, be generally traced to previous inflammation, and the consequent alterations of

structure induced thereby. Thick wind is usually the premonitor of the disorder. When a portion of the lung has been destroyed, the surface being thus reduced, a greater effort must be required to supply the necessary quantity of pure blood, and hence the violent efforts to effect this purpose, when a portion of the air-cells are demolished.

REMEDIES.—A radical cure of broken wind, I believe, has never taken place; that is, after a rupture of a portion of the air-cells. All that can be effected is a palliation of the complaint. The food should consist as much as possible of that which affords the greatest nourishment in the smallest compass. Oats, and particularly beans and peas, as well as carrots, have this qualification. The bowels should be kept gently open by means of an occasional limited meal of green food, when in season; and when this cannot be supplied, then mild purgatives may be administered. The following prescription may be used when required:—

Aloes $1\frac{1}{2}$ drachm,

Nitre 2 drachms,

to be given in a ball made of syrup or treacle, or it may be given in a draught of gruel. When the bowels are sufficiently open, then they may be kept so by frequent mashes, in place of hard and dry food. Let his drink be frequent and in small quantities through the day, but after he is suppered let him have an ample draught. Avoid exercise or labour when the stomach is full. A broken-winded horse should never be pastured, as, by having his stomach constantly full and distended, the disease is increased. By strict attention to all these rules, and by gentle, well-timed, and progressive exercise, broken-winded horses may be rendered capable of performing a fair proportion of labour, and may even live a considerable number of years under the influence of this affection, by cautious treatment.

Experience must have taught many persons possessing a number of horses, that frequent instances have occurred of horses having been put into a straw-yard perfectly sound, coming out broken-winded. The food affording but little nutriment, the animals require to keep their stomachs always full, which causes a constant pressure upon the lungs; and their action being thereby restricted, a violent effort becomes necessary to effect respiration, and hence rupture of the partitions of the air-cells take place.

In this complaint horses may have inflammatory affections, as well as periodical returns of difficulty of breathing. When this is the case, bleeding must be resorted to, and purgatives used at the same time. These, accompanied by mercury, have been found excellent remedial means of alleviating the disease. The following are the proportions:—

Calomel	.	.	.	1 drachm,
Aloes	.	.	.	2 drachms ;

these to be made in the form of a ball, and administered twice a week, while the affection continues.

Various degrees of broken-wind produce certain effects, which have each their technical designations by dealers and jockies. These are—

ROARING,

Which is a remnant of improperly treated catarrh. The alleviating remedies—for cure there is none—are gentle exercise, augmented slowly and daily until the animal is brought to the utmost of its power, without manifesting that well-known sound when under exercise or labour. The following drench will be found of considerable benefit when cough accompanies this complaint:—

Lintseed	.	.	.	1 pound,
Treacle	.	.	.	8 ounces,
Vinegar	.	.	.	1 pint.

Let the lintseed be put into six pints of hot water, and allowed to stand by the side of the fire until it has fairly taken the substance out of the seeds. Then let it be strained and the other ingredients mixed with it. Give the horse about half-a-pint of this five or six times during the course of the twenty-four hours.

WHEEZING.

This stage of the disorder is known by a wheezing sound being heard like that of the human being afflicted with asthma. It has its seat in the membranous lining of the windpipe, low down, where it separates into two branches, to convey the air to both lobes of the lungs; there a mucus fluid lodges in the passages. Some old horses wheeze only after feeding, and when lying down. But with horses that are confirmed wheezers, they can be heard at all times. In purchasing horses it would be well to try them at a sharp trot or gallop, to ascertain if they are wheezers, as it is sure to manifest itself after action. Wheezers should not have too much hay, but enough of corn, which should be given frequently, as well as water.

The drench mentioned at page 64 may be given with advantage in this complaint.

PIPING.

The seat of the disease in this stage is higher up than the former, and consists in a strict contraction of the trachea, which considerably diminishes its width. The sound produced in consequence is a sort of shrill wheezing, nearly like

a whistle. Blisters have sometimes been found to alleviate this disease ; but a complete cure is quite hopeless.

A WHISTLER.

This is a mere modification of piping, and consists of an inflammation situated so high up as the glottis, or higher ring of the windpipe. The sound is more shrill than in the former complaint ; and, like the former, it cannot be cured, but the drench last mentioned will sometimes do the horse good.

CHRONIC COUGH.

SYMPTOMS.—This is a constant, irritating cough ; which in particular manifests itself after feeding and drinking, and on first being exposed to the open air in the morning, and more especially after any excitement, such as hard work, a sharp trot, or a gallop. In most instances the complaint is accompanied by a staring coat.

CAUSES.—Chronic cough has its origin in some previous inflammatory complaint. In becoming a fixed disease, it will proceed from inflammation of the air passages ; or it may be from severe irritation of the lower portion of the windpipe. When the seat of the disorder is caused by inflammation in the substance of the lungs, it will manifest itself after eating, which is occasioned by the distended stomach pressing upon the diaphragm, and this organ in its turn pressing upon the lungs. This renders them less capable of transmitting the air through their passages ; which occasions considerable excitement, from the great effort made to perform respiration, and hence the irritating cough is induced.

REMEDIES.—The following dose to be given every night, until the cough is modified :—



Digitalis	.	.	.	$\frac{1}{2}$ drachm,
Nitre	.	.	.	1 drachm,
Emetic tartar	.	.	.	$\frac{1}{2}$ drachm ;

to be made up in the form of a ball, with tar. If this fails to lessen the irritation, a blister should be applied to the throat, extending from one ear to the other, and reaching six or eight inches down the windpipe, which will have the effect of lessening the irritation of the fauces or the larynx, if the inflammation exists in that situation. Sometimes a blister extending to the lower part of the windpipe, as far as the chest, has had a good effect.

The food should be of an opening nature, as dry feeding, such as straw and chaff, is always found to increase the complaint : grass and other green food will have a salutary effect in this and other similar diseases.

Horses may have chronic cough without their general health being affected by it ; and should the above remedies prove ineffectual in removing it in a few weeks, there will be no use in persisting in attempts at a cure ; and it is only when the complaint assumes a more than ordinary degree of coughing, that medical treatment should be resorted to. A great object is to avoid exposing the animal to sudden transitions from heat to cold ; as a horse afflicted with chronic cough is more liable than others to be affected by changes of temperature.

THE MALIGNANT EPIDEMIC.

SYMPTOMS.—This complaint is marked by a complication of disagreeable symptoms ; there is a fetid discharge from the nostrils, with an extremely stinking breath, and the whole evacuations become disgustingly offensive, accompanied by a quick, small, and weak pulse, which is hardly sensible to the touch ; the animal refuses to eat, and a

rapid loss of strength ensues. The inflammation, which is at the root of the disease, is soon followed by mortification, which speedily spreads from the place first affected through the whole of the cellular tissue, and the body is soon entirely under its malignant influence.

REMEDIES.—This is one of those diseases which it is easier to prevent than to cure. Indeed its course is so rapid, that there is but a short time to apply remedial means. We are still little acquainted with its remote cause, but it appears to be a violent stage of catarrhal fever, as the primary symptoms are nearly the same. Gentle bleeding has been known in some cases to be attended with beneficial results, but this remedy must be exercised with very great caution. If the animal has sunk to the low stage of debility, bleeding must on no account be attempted; and purgatives at first must be of a gentle kind, and frequently repeated, to dislodge the fetid matter which occupies the bowels. Should the disease be taken in time, and the bowels have got thoroughly cleansed, the following stimulant should be given in doses for four or five days, or longer, if necessary:—

Opium	.	.	.	2 drachms,
Gentian	.	.	.	2 drachms,
Prepared chalk	.	.	.	2 drachms,
Ground ginger	.	.	.	1 drachm,
Columbo	.	.	.	1 drachm,
Port wine	.	.	.	$\frac{1}{2}$ pint.

The horse should also be fed upon green meat, mashes, and gruel, until he recovers strength.

CATARRHAL FEVER, OR DISTEMPER.

SYMPTOMS.—This disease usually manifests itself in the same manner as inflammation of the lungs and common

fever, with a cold shivering fit, heat in the mouth, cough, and considerable heaving of the flanks. The eyeballs become red, and the eyes dull and languid; the membrane of the nose also assumes a red and inflamed appearance, although in a less degree than in inflammation of the lungs, and is accompanied by a slight discharge, which is of a watery consistence at first; but it becomes thicker, with a number of clotted flakes, which sometimes adhere to the mucous membrane of the nose, and look like white ulcers. It then puts on the appearance of pus, accompanied by an offensive smell. In some instances it assumes a livid cast, although this is by no means a common occurrence. The glands of the throat and under the jaw become swelled. The animal has then much difficulty in masticating and swallowing his food, which he half chews, and then drops; he also drinks water with much difficulty, especially if it is cold. In his endeavours to drink he will cough frequently, and the saliva will flow from his mouth into the pail. In many instances the animal suffers considerably in the frequent and painful attacks with which he is seized, which he manifests by restlessness and stamping his feet. Swelling of the legs accompanies this complaint, and also enlargements in the chest and belly, with a rapid pulse, amounting to from sixty to seventy beats in a minute, varying of course with the intensity of fever with which the disease is always accompanied. Veterinary surgeons do not consider these swellings an unfavourable symptom. Very great weakness generally comes on, so much so that the horse will stagger while moving about in his stall, and will even lean against the sides to support himself.

CAUSE.—The remote cause of this disease is not well understood. It may arise from a common cold, or may be induced by a certain condition of the atmosphere. One

thing is quite certain, that it is more common in the middle of spring or beginning of autumn. Some seasons it is epidemical, and horses in many different parts of the same district will be attacked by it ; and it seems to prevail more when wet and cold weather sets in at those seasons, particularly if it alternates from heat to cold. Many circumstances have led to the belief that this complaint is infectious, and it is only proper to remove horses labouring under it to some distance from the others.

REMEDIES.—Much skill is required in the treatment of this disorder, and it is necessary to study it with great attention before remedial means are attempted, whether by the veterinary surgeon or the owner of the horse. Fever is one of its earliest symptoms, which is rapidly succeeded by loss of strength. If at the first appearance the disorder is ascertained, bleeding should be immediately resorted to, but care must be taken not to overdo this. We can give no specific quantity, as this will depend upon the state of the febrile excitement. But we would recommend that it never should exceed four quarts, although, in most cases, from two to three will suffice. Always avoid taking as much as will produce faintness. Should the pulse become hard and rapid after the first bleeding, then it will be necessary to repeat it. And if coldness in the limbs, with redness of the mucous membrane of the nose ensue, more blood must again be taken, but the quantity should be limited. If with these symptoms weakness prevails, and the horse staggers, and if the inside of the nostrils present a livid hue, then bleeding would be prejudicial.

But whatever condition the animal is in, the bowels should be cleared out. The following purgative may be administered :—

Barbadoes aloes . . . 2 drachms,

and a single drachm more in twelve hours thereafter. These to be given in solution, or in a ball; and if the soil does not indicate a healthy colour, another drachm may be given when twelve hours have again elapsed. Should these prove ineffectual, then recourse must be had to back-raking, and injections of gruel given at the same time.

Should debility not extend to the hind legs, although the other febrile symptoms continue, moderate bleeding with clysters will be found of service. If the inner surface of the eyelid is red, bleeding will then be indispensable; and if not removed at the first operation, then recourse must be had to it a second time, but of course in moderate quantity. This should be followed by a laxative draught, which ought to be repeated twice, viz. :—

Socotrine aloes, powdered	2½ drachms,
Prepared kali . . .	1 drachm,
Mint-water . . .	½ pint,
Water . . .	1 pint.

Repeat in twelve hours. When the purging has subsided, give the following distemper-ball :—

Crude sal ammoniac . . .	1 ounce,
Nitre	1 ounce,
Soap	4 drachms,
Camphor	2 drachms ;

to be formed into two balls, with a teaspoonful of lintseed-oil and a solution of gum-arabic. A ball to be given morning and evening for three or four days. At this stage of the complaint it is necessary that urine should be voided in quantity, and exhibit a clear and healthy appearance.

The food should be of a restorative character when the symptoms of disease have subsided. Gruel and bran-mashes in small quantities, and given frequently, will be

found the best means of invigorating the animal. When the horse shows signs of returning strength, then a small quantity of fresh sweet hay may be given, and oats that have been steeped in boiling water; occasional draughts of oatmeal gruel, and, as a stimulant, small malt-mashes. If the weather is mild, let the animal enjoy a few hours of the middle of the day in a field; but not without clothing, and especially a breast-piece cloth and head-covering, or hood.

In some instances inflammation of the throat accompanies this complaint, in which case the animal will refuse to eat. To remove the inflammation the submaxillary glands and also the parotid glands should be immediately blistered. It is a mistaken idea to attempt stopping the nasal discharge; and it ought rather to be encouraged by means of warm mashes placed in the manger, or in nose-bags, while the head is kept perfectly warm by clothing.

When the disease is protracted, great weakness generally follows; in which case, although the fever has not yet been reduced and means are taken to subdue it, it will be absolutely necessary to give such food as is of a nourishing nature to support the animal, such as carrots, malt-mashes, mashed hay, and tares, or other green meat.

If the animal persists in refusing food, carrots should be forced in between his grinders which will in most instances induce him to take food. If this should fail, then a pail-full of gruel should always be placed in his manger, which he is sure to partake of occasionally. This will sustain him until a favourable turn of the disorder has taken place.

Every means should be adopted to keep the limbs warm, by rubbing, warm bandages, &c.

If this disease is not removed in a moderate length of time, thick wind, chronic cough, and broken wind may b

thereby induced ; and he will, during the remainder of his life, be liable to colds and other affections of the lungs.

The symptoms of this malady are something similar to those which accompany inflammation of the lungs ; and as the medical treatment differs considerably, it becomes a matter of considerable importance to be able to distinguish the one from the other. Inflammation of the lungs is always attended by a febrile and oppressed pulse, and is indicated by an early discharge from the nose, but is unaccompanied by the intense redness of the mucous membrane of the nostrils—which is manifested in catarrhal fever ; and is invariably attended with a painful, frequent, and hard cough, enlargement of the glands, and inflammation of the throat, variable warmth and coldness in the limbs, and rapid loss of strength.

In the year 1832 a distemper prevailed which swept off many horses. It was considered a contagious epidemic, and was ascribed to some latent atmospheric phenomena, which was never satisfactorily accounted for ; nor were the modes of treatment of the time attended with beneficial results. By post-mortem examinations it was found that the liver was invariably affected, and an imperfect secretion of bile was the consequence. This caused increased action of the pulmonary arteries, followed by rupture and congestion of blood at the heart, producing immediate death.

FISTULOUS WITHERS.

SYMPTOMS.—This consists of one or more hot and tender tumours formed upon the withers. If neglected it ends in a large and deep ulcer, and will sometimes extend beneath the shoulder-blade—or scapula—and consequently becomes extremely difficult of cure.

CAUSE.—If the saddle does not fit exactly to the shape of the withers, these tumours may be formed.

REMEDIES.—When first detected, it may possibly be removed by cold applications. The following lotion should be applied to the part affected, with a sponge :—

Alum powdered	.	.	1 ounce,
Sulphuric acid	.	.	1 drachm,
Water	.	.	1 pint.

Or the following may be substituted for it :—

Corrosive sublimate	.	.	2 drachms,
Muriatic acid	.	.	4 drachms,
Water	.	.	1 pint.

It will be rendered more pungent by the addition of a drachm of sulphate of copper.

If the above, after being carefully applied, does not diminish the size of the tumour ; or if it increases and becomes more sensitive on being touched, then fomentations, poultices, and stimulating embrocations should be resorted to, so as to bring forward the tumour to a suppuration. When the matter has formed, a seton should be passed through the top and bottom of the tumour to allow the discharge to pass freely off. After which the same treatment must be pursued as we have recommended in the poll-evil.

Fistula in the withers is frequently the cause why some horses stumble on the road. If this is suspected, then the saddle should be taken off ; and if the part pressed on by the saddle be hot and enlarged, and the horse feels sensibly the pressure, then fistula of the withers may be apprehended. If taken at this time, and a lotion be diligently applied with a sponge, it is almost certain to prevent the disease becoming matured.

Where this disorder has been neglected, and the ulcer has

extended to the muscle below the shoulder-blade, in many instances the matter will work its way to the elbow, and sometimes to the bones of the withers, and render them carious.

In severe cases the following hot stimulant must be poured into the fistulous ulcers :—

Resin	$\frac{3}{4}$ ounce,
Tar	1 ounce,
Mutton-suet	1 ounce,
Bees'-wax	$\frac{1}{2}$ ounce ;

this to be melted slowly over a fire, and when completely dissolved the following must be added to it :—

Spirit of turpentine	1 ounce.
Verdigris	3 drachms.

After the above the treatment will have to be the same as recommended in the poll-evil.

WARBLES, SADDLE-GALLS, &c.

CAUSES.—When saddles do not fit, various tumours are produced on the back of horses. The name “warbles” is applied to small tumours produced by pressure, which sometimes do not ulcerate, but are nevertheless troublesome and painful to the animal. When they ulcerate they are termed sitfasts, from a small piece of callous skin in their centre, which adheres so firmly as to require great force to remove it, and frequently cannot be extracted without being cut out.

REMEDIES.—The first thing that must naturally occur to the mind of a humane man, is to have the stuffing of the saddle altered so as to make it fit, and thereby prevent undue pressure on any particular spot, and the animal should be allowed sufficient rest to permit the tumours to be taken

up by absorption. To facilitate this, cold lotions should be frequently and plentifully applied, such as goulard, vinegar, or brine. If these fail, and ulcers and steadfasts appear, then a gentle blister should be applied, which generally has the effect of removing them from their seats; after which the wound must be dressed with Friar's Balsam, or Turner's Cerate, or, where these cannot readily be procured, with a mixture of bees'-wax and oil in equal proportions.

Saddle-galls are generally cured with facility by an application of strong brine, with the addition of tincture of myrrh, in the proportion of a fourth part to three parts of brine.

We have frequently been disgusted with the unfeeling cruelty of some thoughtless persons riding their horses day after day, with large sores under the saddle. Such individuals but ill deserve to be the possessors of horses.



CHAPTER IV.

DISEASES OF THE ABDOMEN AND INTESTINES.

THE complaints of the abdomen and bowels in horses are pretty numerous, and some of them attended with most serious consequences. In most of them the groom or horse-keeper ought to be extremely vigilant, and must watch their progress narrowly. Some are slow in their effects, while others are so rapid, that before proper remedies are applied the disease will have gained such an ascendancy that ministrations are of no avail. We would particularly allude to two complaints which are frequently mistaken for one

another, the distinctive symptoms of both we shall point out when we treat of them.

INFLAMMATION OF THE LIVER.

SYMPTOMS.—Although this disease is rare in horses, it nevertheless occasionally occurs, and is not easily to be detected from inflammation of the bowels. Its principal characteristic is a restlessness in the animal, without the appearance of suffering that pain which accompanies other inflammatory complaints.

REMEDY.—The following should be given for two or three days successively, in the form of a small ball :—

Compound extract of colocynth	. 7 grains,
Calomel . . . . .	. 6 grains,
Syrup . . . . .	. 1 drachm.

Should the above not remove the uneasy symptoms, it will be necessary to have recourse to a veterinary surgeon.

THE JAUNDICE, OR YELLOWS.

SYMPTOMS.—The eyes are yellow, as well as the skin of the mouth, and also the other naked parts. The dung is voided in small, hard balls, and the urine of a high yellow colour; the appetite is blunted, and general weakness evinces itself.

CAUSES.—This complaint is occasioned by some obstruction in the single duct—for the horse has but one—through which the bile is conducted from the liver to the intestines; or from an increased and undue quantity of bile. The horse being destitute of a gall-bladder, the bile flows immediately as it is formed.

REMEDIES.—Purgatives must be employed to restore the functions of the organs to their healthy condition. These

must be administered with caution, and in small quantities, frequently repeated, until the bowels are freely opened. It would be dangerous to risk strong doses, as common inflammation of the intestines may cause the symptoms, which apparently mark this disease. Let the following be given twice a day :—

Barbadoes aloes	.	.	2 drachms,
Calomel	.	.	1 drachm.

Bleeding in moderate quantity will also be found of service. Thin, slightly warmed gruel should be given in abundance, together with carrots and green food, particularly tares. Let the horse be warmly clothed if the weather is severe ; and the stable should be properly ventilated, but not allowed to be too cold. The following should afterwards be given :—Bran-mashes, with green meat, for four or five days ; also drink of thin warm gruel.

If purging should become pretty active after administering the above medicine, it should not be hastily checked unless inflammatory symptoms begin to appear, or if the horse exhibits weakness. In either of these cases then the following medicine may be given :—

Gruel	.	.	.	1 gallon,
Prepared chalk	.	.	.	1 ounce,
Catechu	.	.	.	$\frac{1}{2}$ ounce,
Opium	.	.	.	$\frac{1}{4}$ ounce.

After this give the following tonic :—

Gentian	.	.	.	2 drachms,
Camomile	.	.	.	2 drachms,
Ginger	.	.	.	1 drachm ;

formed into a ball, and repeated daily until the discharge is checked.

HERNIA, OR RUPTURE.

This consists of a portion of the intestine being protruded from the abdominal cavity, either through a natural opening or through one caused by disease. In many cases the intestine may be returned into the cavity, but it seldom is an effectual cure, in consequence of the impossibility of applying a truss to keep it up. There are other instances where, the gut having passed through the inguinal ring and protruded into the scrotum of the entire horse, or in the groin of the gelding, which may in time become so narrow as not to admit of the gut being again returned, in consequence of becoming thickened and the protruded portion being filled with the dung. This is called strangulated hernia ; and can only be successfully treated by a veterinary surgeon, and should on no account be attempted by any other, especially an uneducated person.

INFLAMMATION OF THE KIDNEYS.

SYMPTOMS.—This complaint is usually preceded by fever ; and when completely formed, the horse stands with his hind legs wide apart, and has an awkward gait in his walk. He withdraws from the pressure of the hand on the loins, which also indicate an undue heat, considerably above that in the natural condition. When turning with moderate quickness, he feels pain, and looks wistfully back at his flanks ; a suppression of the action of the urinary organs takes place, and is followed by a difficulty in voiding urine, which comes off in small quantities, and is generally high coloured, and not unfrequently mixed with blood. Strong efforts are made by the horse to discharge it in larger portions, but at length it is almost quite suppressed. Hence

it will be manifest that there is an affection of the urinary organs ; but whether in the kidneys or bladder it will be difficult at first to determine. At this stage of the disease the pulse is hard and accelerated ; it soon afterwards becomes small, although retaining its character of hardness.

In order to ascertain the seat of the disease, the hand must be introduced into the rectum, and if the bladder (which is situated under the rectum) feels distended and hard, then it is certain that the neck or sphincture of the bladder is inflamed. If, on the other hand, it is soft and feeling empty, with a heat in the intestines over it, then there is inflammation of the bladder itself ; but if there is no unnatural heat over it, then it may be certain that the affection is in the kidneys.

CAUSE.—Musty or mow-burnt oats, from their diuretic properties, are often the cause of inflammation in the kidneys. Indeed very strong diuretics, frequently given, will bring on inflammation of the kidneys as well as weakness in the parts. A sprain in the loins often proves the remote cause of this disease ; or a sudden check, throwing him back upon his haunches, and giving a sudden shock to the muscles of the loins, is another cause. Exposure to rain and being allowed to cool and dry without having been rubbed down, will cause inflammation in the kidneys.

REMEDIES.—Prompt and copious bleeding must be resorted to, after which a strong purgative must be given, and counter irritation produced as near as possible to the seat of the disease. To effect this, use a mustard blister, as turpentine and Spanish flies are improper in this disorder. Do not give the animal any diuretics, because these only add to the excitement, already too great. The horse must be kept warm by clothing, his legs well bandaged, and as much water given him as he will take. The food should consist

of mashes. The following should be given to him three times a day :—

White hellebore	.	.	1 scruple,
Emetic tartar	.	.	1 drachm,
Lintseed meal	.	.	2 drachms ;

made into a ball with treacle.

INFLAMMATION OF THE BLADDER AND ITS SPHINCTURE.

SYMPTOMS.—When treating of inflammation of the kidneys, we described fully the symptoms of inflammation in the neck of the bladder. In this variety of the complaint the urine is voided in small quantities, and with considerable pain each time ; and in extreme cases a total suppression takes place. When this is the case the bladder becomes exceedingly inflated under the rectum, and may be easily felt by the means recommended in the former article. It is a spasm which causes this tightening of the neck of the bladder.

CAUSES.—This is produced by some acrid substance, which has been generated in the system by the use of food of a heating nature, forming a chemical compound of an acrid quality in the urine. Stone in the bladder will also produce this disease. Some persons are so absurd as to administer the tincture of cantharides by way of hastening the season of horsing in the mare, which is almost certain to inflame the coating or sphincture of the bladder.

REMEDIES.—Bleeding to a considerable extent will be necessary, being the most likely thing to reduce the spasm. Some have gone so far as to let the blood flow until fainting is induced. The disease by such treatment is very often removed at once. But should this not relieve the malady, then the following must be administered :—

Powdered opium	.	.	1 drachm,
Lintseed meal	.	.	3 drachms ;

given as a ball or in a drink of gruel every three hours, and a strong blister put on at the same time. In cases where the mare is affected, the urine may be drawn off by means of a catheter. This will have a considerable influence in relieving the animal, and by taking off the tension will tend to abate the inflammatory symptoms. The same remedy is of difficult application in the horse, and should never be attempted by any one but a veterinary surgeon.

STONE IN THE BLADDER.

SYMPTOMS.—Irregularity in the discharge of urine, with occasional suppression of it, and fits resembling spasmodic colic, are the symptoms which attend this disease. To ascertain if it is really stone which produces these effects, the horse should be thrown on his back and the hand introduced into the rectum, when the stone, if it exists, will be easily felt.

REMEDIES.—If the stone is of any size it must be extracted by an operation, which can only be performed by a regular veterinary surgeon. When it is small, or only appears in the form of gravel, diuretics are the only remedies which can do good ; these, by inducing an increased flow of urine, may carry with it the smaller concretions. The following will be found a useful diuretic, given twice or thrice a day in a drink :—

Purified nitre (nitrate of potash)	3 drachms,
Digitalis	1 drachm,

DIABETES.

SYMPTOMS.—This disease consists in an excessive discharge

of urine ; and, fortunately, is not of such common occurrence among horses as in the human species.

CAUSES.—Bad food will produce irritation of the kidneys, as well as the improper and too frequent use of strong diuretics, which cause inflammation and an increased action in the kidneys.

REMEDIES.—Whatever tends to lessen the undue action will be the best remedy. Bleeding, therefore, will be the first alternative, although it must not be carried to the same extent as in common inflammation. This to be followed by purging, astringent medicines, and counter irritation. The following should be given in doses three times a day :—

Wortle-berry leaf, powdered	. 2 drachms,
Catechu	2 drachms,
Opium	$\frac{1}{2}$ drachm.

Green meat and carrots will be of much use during this disease, as well as mashes.

STALING OF BLOOD.

SYMPTOMS.—The symptoms of this complaint are nearly allied to those of inflammation in the kidneys ; and it always manifests itself by the highly-coloured urine, mingled with blood. If the bowels are not easy, let them be opened by the following cathartic :—

Barbadoes aloes	5 drachms,
Cream of tartar	$\frac{1}{2}$ ounce,
Ginger, powdered	1 drachm,
Balsam of copaiva	30 drops ;

to be formed into a ball and administered. When it has operated, the following must be given once a day until the urine has assumed its natural colour :—

Peruvian bark, powdered	.	$\frac{1}{2}$ ounce,
Prepared kali	. . .	2 drachms,
Antimonial powder	. . .	$\frac{1}{2}$ ounce,
Nitre, in powder	. . .	1 ounce,
Balsam of capiva	. . .	$\frac{1}{4}$ ounce.

Let the above be well powdered together, and then given in three ounces of lintseed, boiled in half-a-gallon of water reduced to three pints.

INFLAMMATION OF THE BOWELS.

The intestines are subject to two different kinds of inflammation, namely, that of the mucous membrane or internal lining of the gut. The second is in the external coating of the bowels. These are very different in their characters, and consequently in the mode in which they must be treated.

INFLAMMATION OF THE MUCOUS MEMBRANE.

SYMPTOMS.—This is accompanied with violent purging, proceeding too often from over-doses of physic being administered to the horse, or from acid generated in the bowels by the food, or some other unknown cause. In addition to the purging, considerable pain attends this disease, which is indicated by the animal frequently looking round to his flanks, with a heaviness in his breathing, accompanied by a quick feeble pulse, with a hot mouth, ears, and legs.

CAUSES.—Sudden exposure from a warm to a cold atmosphere, and being allowed to drink plentifully of water when over-heated, or having his belly and legs wetted with cold water when too warm, are all causes which induce this complaint, more especially in high-fed horses.

REMEDIES.—When accompanied by excessive purging, with great pain, astringent medicines should not be administered.

All food should be denied him, and in its stead give him gruel, a decoction of lintseed, thin starch, or arrow-root, or a strong solution of gum-arabic. Clysters of warm gruel would also be proper, in which a quarter of an ounce of aloes is mixed. Some prefer from six ounces to half-a-pound of Epsom salts. These should be administered with Reid's patent pump. If the irritation and indications of pain still continue after twelve or fourteen hours have elapsed, it will be necessary to give the following :—

Gruel	2 quarts,
Prepared chalk . .	1 ounce,
Catechu	4 ounces,
Opium	2 scruples ;

The above to be repeated every five or six hours until the purging and pain are allayed, after which the doses should be lessened in quantity and frequency.

If the inflammatory symptoms are very great, it will be necessary to have recourse to bleeding ; but this must only be resorted to when accompanied by general febrile symptoms. The horse must be kept warm and well-clothed, with his legs bandaged after being rubbed thoroughly.

SPASMODIC COLIC.

SYMPTOMS.—This disorder in general comes on very suddenly, without any premonitory signs. The horse becomes very restless, shifts his position, paws the ground, and looks round with anxiety at his flanks ; sometimes raising his foot as high as his belly and striking it violently : he will also lie down and roll about on his back. In a few minutes the spasm subsides, and the animal after shaking himself will resume feeding. At longer or shorter intervals the attack is renewed, but with increased violence ; he will

throw himself with considerable force on the ground ; will break into a copious perspiration, and heave greatly at the flanks. These spasms are renewed at intervals, and gradually become less frequent and less severe ; or if, on the contrary, they are more frequent and acute, and at length manifest a nearly uninterrupted series, then it may be suspected that violent inflammation and mortification has taken place, and that death will speedily ensue.

CAUSES.—Stones and large earthy lumps in the intestines cause colic pains, but it cannot be known when these are present. Drinking cold water when the animal is overheated is a frequent cause of these spasms and pains. Green food is also apt to induce these pains when taken in large quantities, and especially if too hard worked after it.

REMEDIES.—A combination of opium and turpentine are valuable specifics in this disorder, in the following quantities, and usually produce almost immediate relief :—

Turpentine	.	.	.	3 ounces,
Laudanum	.	.	.	1 ounce,
Warm ale, or gruel	.	.	.	1 pint.

If in half-an-hour after the above has been administered no visible mitigation of the complaint exhibits itself, it will be necessary to have recourse to bleeding ; because a long-continued succession of spasms is almost certain to induce inflammation. The belly should be well rubbed with a towel or brush, and the horse should thereafter have moderate exercise, when it is clearly ascertained that it is colic pain. In about an hour after the above has been given, half the quantity of each ingredient may be administered, in combination with three-quarters of an ounce of Barbadoes aloes. Injections of warm water, or gruel, mixed with a small quantity of aloes, will have an excellent effect in this complaint.

The following embrocation has produced good effects during the time the animal was suffering from spasms. It is made into a pretty thick paste and rubbed over a considerable portion of the belly :—

Mustard, in powder	.	.	8 ounces,
Camphor	.	.	1 ounce,
Oil of turpentine	.	.	2 ounces,
Water of ammonia	.	.	2 ounces.

This disease and inflammation of the bowels are frequently mistaken for each other, which is caused by the general appearance being somewhat similar; but if strict attention be paid to both diseases, it will be found that there are symptoms connected with each disorder specifically different, which will at once be understood by the following tables :—

INFLAMMATION OF THE BOWELS.

1. PULSE considerably accelerated, but very indistinct.

*hard small & wiry
as frequent as 90
or 100*

2. Gradual in its approach, with previous febrile indications.

3. Lies down, seldom rolls on his back, starts to his legs suddenly.

Body warm

4. Legs and ears generally cold.

5. Belly exceedingly tender, and when touched causing pain.

6. Motion increasing the painful symptoms.

SPASMODIC COLIC.

1. PULSE natural, or lower than in its natural state, but accelerated and more full during the spasms.

2. Sudden in its attack, but destitute of febrile symptoms.

3. Lies down, and almost invariably rolls on his back, which seems to give him relief.

4. ^{Body} Legs and ears of a natural heat.

5. Rubbing the belly gives relief to the animal.

6. Motion evidently affording relief.

- | | |
|---|--|
| 7. Constant pain. | 7. Intervals of rest. |
| 8. Rapid prostration of strength. | 8. Strength hardly affected. |
| 9. Mucous membrane inside the nostrils very red. | 9. Mucous membrane of its ordinary colour. |
| 10. Lining of the eyelids unusually red. | 10. Lining of the eyelids of its natural colour. |
| 1. Peristaltic motion of the bowels excited, with the anus hot. | 11. Slight motion of the intestines, unless by purgative injections. |

Pawing of the ground is common to both complaints, but in cases of entanglement of the gut, he desists from pawing.

Both this and the preceding complaint are induced by various causes. But if symptoms similar to them are caused by eating green food in too large quantity, a different mode of treatment will be necessary.

ENTANGLEMENT OF THE BOWELS.

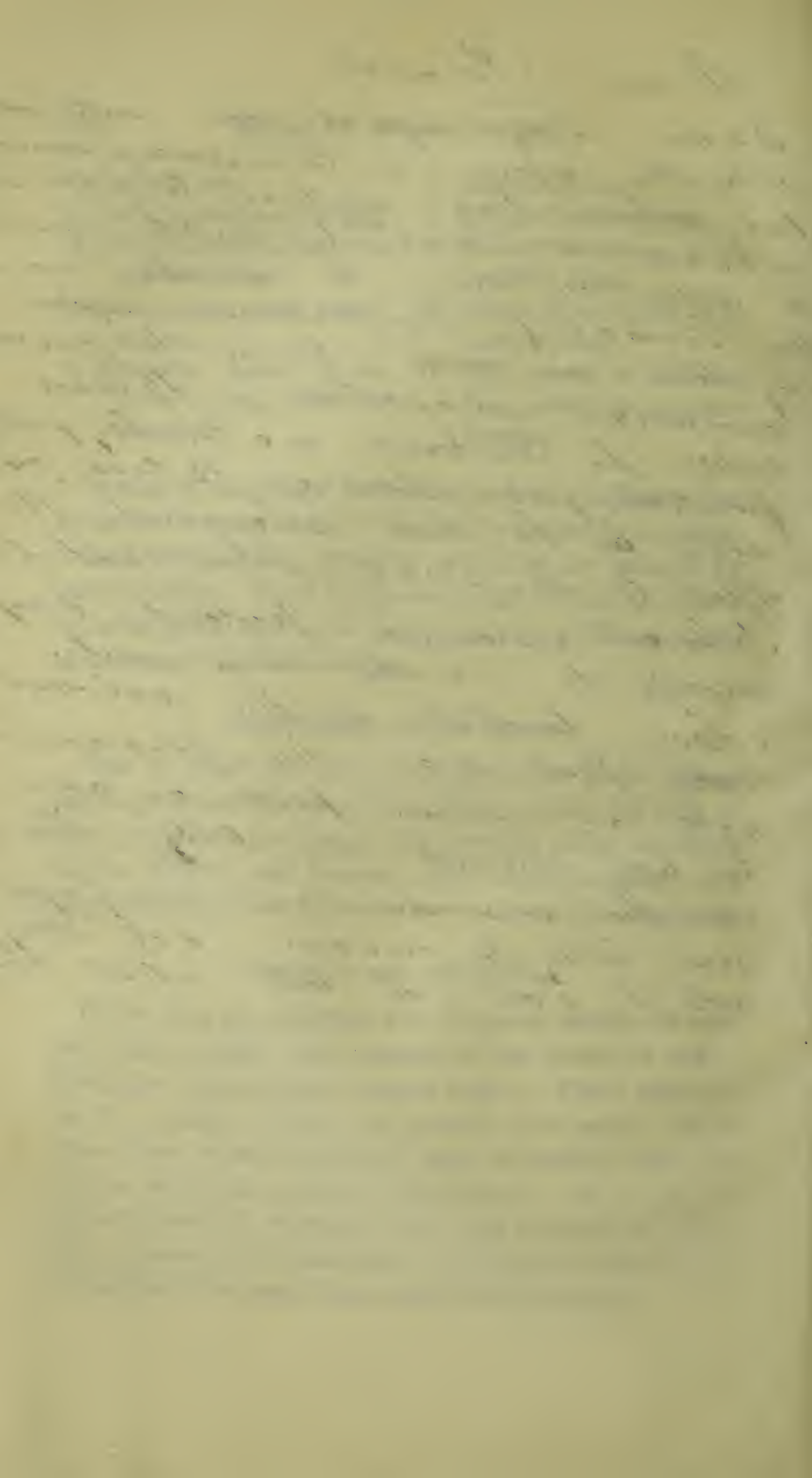
This is caused by colic, in consequence of the animal throwing himself about while suffering under the pain of that complaint; portions of that intestine called the ileum become twisted and knotted, and drawn together with astonishing firmness. There is no remedy for this complaint.

STONES IN THE INTESTINES.

Horses that are subject to very frequent attacks of colic pains have usually stony masses in the cæcum or colon. Sometimes they are some pounds weight. These, obstructing the passage of the gut, produce colic pains; and at other times, when exceedingly large, by pressing upon the mucous membrane, produce inflammation. But as yet no distinctly-marked symptoms have been detected by which their presence can be ascertained. Hitherto no certain mode of treatment has been discovered for their removal.

From Perard

I can only repeat do not rely
altogether upon internal remedies
but, when they appear to fail, have
recourse at once to such remedies
as will be sure to make such
an evacuating impression upon the
system as will tend to produce
muscular relaxation. Bleed
until the Patient is actually pale,
prostrate from loss of Blood; & as
soon as he has recovered the
effects of this evacuation, exhibit
Tobacco enema potent & copious
enough to make him reel;
& dash buckets of the coldest
water that can be procured
with as much force as can
be used against his belly. There
are the remedies, in my opinion
most likely to succeed. & if they do
not, I cannot tell what will.





INTUSUSCEPTION OF THE INTESTINES.

This is another evil arising from a long-continued spasmodic action of the ileum, which sometimes causes an inverted pressure from the cæcum towards the stomach, which overcomes the natural action, which forces this contracted portion of the intestine into a portion above it, which retains its natural calibre. The irritation thereby produced increases the upward action, and causes still more of the intestine to be forced inwards, until an obstruction of an insurmountable character is produced. Continued and unmitigated pain is the only symptom which may lead to a suspicion that this incurable malady has taken place.

INTESTINAL WORMS.

A variety of worms inhabit the intestines of horses, and when they become numerous often prove injurious to the constitution of the animal. Although a respectable writer says they are not of much consequence unless they are numerous, we would recommend that the sooner they are expelled the better, however small the number may be, for this simple reason—that where there exists a single pair, there will naturally be an increase of their species. It is perfectly true that by what means they at first effect a lodgement into the animal system is a mystery yet to be solved; but it is equally true that naturalists have detected that these parasites are formed male and female, and as Nature frames nothing in vain, they must propagate in the ordinary manner of reproduction.

SYMPTOMS.—Loss of appetite, griping pains, a rough coat, and tucked-up belly, are symptomatic of worms of the larger species, *lumbricus teres*, or long white round-worms.

very much resembling in form the common earth-worm, which is met with from five to ten inches in length; and itching of the rectum, evinced by a quick twitching of the tail and a small quantity of mucus, which hardens and assumes the appearance of a white powder at the anus, is indicative of *ascarides*—small, needle-formed worms, which lodge in the large intestines, and frequently find their way in great numbers to the cæcum. A third species sometimes, although of much rarer occurrence, inhabits various parts of the intestinal-canal from the stomach downwards. This is the tape-worm, which is known from its broad, flat, tape-like appearance, and consisting of many articulated joints. This species is the most formidable and the most difficult to be removed.

REMEDIES.—When the symptoms which we have pointed out are noticed, the groom should carefully watch whether worms are voided, to ascertain their existence. Still, however, they may be lodged in the intestines without being evacuated; and when there is a well-grounded suspicion that they inhabit the body, a dose of some vermifuge should be given. This may consist of eight grains of calomel, made into a ball, with oatmeal and treacle.

For the expulsion of the round-worm, the following anthelminthick should be administered :—

Calomel	.	.	.	2 drachms,
Rhubarb	.	.	.	1½ drachm,
Soccotrine aloes	.	.	.	2 drachms,
Ginger	.	.	.	1½ drachm,

The following may be given, if it is necessary to repeat an anthelminthick :—

Calomel	.	.	.	1½ drachm,
Aniseeds, in powder	.	.	.	½ ounce,
Powder of scammony	.	.	.	½ drachm.

Let it be given at night, and the following purgative in the morning :—

Aloes	5 drachms,
Ginger	2 drachms ;

to be made into a ball with treacle.

When the animal is infested by ascarides, the same medicine should be given as for the round-worm ; but it frequently has not the desired effect. When this is the case, recourse must be had to injections, after the medicine —

Lintseed oil	1 quart ; or
Aloes, dissolved in warm water,	1 ounce.

If the existence of the tape-worm is apprehended, then the following will be the proper remedy :—

Turpentine	$\frac{1}{2}$ ounce,
Castor oil	2 ounces,
Gum arabic, in powder	1 ounce ;

treacle to form it into a ball. Warm mashes to be given for a day afterwards

It seldom, however, happens that these are removed by one dose ; and unless it is quite certain that the entire animal has been discharged, the above medicine must be repeated. If even a link or two is broken off and left in the intestines, these will be regenerated into a perfect worm, as they have the property of reproducing the parts of which they have been deprived.

THE BOTS.

Horses may be infested by bots without suffering material injury from them. But we cannot agree with the opinion of Mr. Bracy Clark, that they are destined by Nature to act upon the food in the stomach by trituration, or as pepper does in the human stomach. Like every other part of the

animal body, this organ is so admirably constructed that in its healthy condition no artificial aid is necessary to enable it to perform its office. If the opinion of Mr. Clark were correct, what would supply the place of those parasites during that portion of the year when the grub assumed its perfect condition?

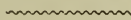
Post-mortem dissection has proved that bots are not so inoffensive as Mr. Clark supposed; as it has been found that horses which have been infested with these grubs had ulcers of considerable extent in the muscular coat of the stomach.

SYMPTOMS AND HABITS.—The progress of the disease generally manifests itself gradually; the horse becomes hide-bound, his coat becomes rough and unhealthy, he loses flesh and strength, although he feeds with his usual appetite, and has frequently a tickling cough.

CAUSE.—The bots are a species of gad-fly called *æstrus equi* by naturalists, which may be observed in the month of July flying actively about the legs of horses in the fields. These flies are represented, (plate x., fig. 1,) which is the common gad-fly. They may be seen flying rapidly towards the sides and knees of horses. These are the females depositing their eggs in the hair, to which they adhere by a glutinous fluid by which they are surrounded (fig. 2, 3.) In a few days the eggs are hatched, and the minute grubs or caterpillars which they contain are set at liberty. This operation is performed by the horse, which, in licking himself, bursts the eggs, and the caterpillar adheres to his tongue, and in the operation of eating the little animal is carried into the stomach along with the food. These caterpillars are provided with a small hook on each side of their mouths and by means of which they cling pertinaciously to the cuticular portion of the lining of the

stomach ; (see fig. 4,) and so tenaciously do they adhere, that the hook will break before they leave their hold. There these pests contrive to locate during the whole winter, and to the end of the following spring, feeding on the mucus ; by which time they have grown to full size, (fig. 5,) and must now undergo a new transformation ; they quit their hold of the coating of the stomach, are carried into the villous portion along with food, from thence pass into the intestinal canal along with the chyme, and at length are discharged with it. The caterpillars thus evacuated seek an appropriate place in the ground, where they assume the imago or chrysalis condition ; and remaining in this state for some weeks, at length break out from their swathing and assume the form of the perfect insect. Immediately after this the males and females pair ; the latter becoming impregnated, set about seeking an appropriate situation where to deposit their eggs, which, in imitation of the parent, by a peculiar instinct, they fix on the hairs of a horse, from whence they are licked off and swallowed in the larva state.

There are two species of gad-flies, the second is known by the name of the red bot, fig. 6 is its larva, and fig. 7 the perfect fly. Their natural history and habits are similar in all respects to the other.



CHAPTER V.

DISORDERS OF THE EXTERNAL PARTS OF THE HORSE.

SECTION I.—THE FORE LEGS.

WE come now to treat of those portions of the frame of a horse most intimately connected with his action, and his

essential value in the service of man. Unfortunately these are but too often liable to disease ; and the animal afflicted with maladies of those parts is not only rendered less useful to his possessor, but also less valuable in the market, as the extremities embrace the entire apparatus of progressive motion, and consequently that action in which mankind are chiefly interested in this useful animal.

To thoughtless and reckless masters, and careless, cruel, and unthinking servants, this noble animal owes many of his complaints, both internal and external. And what is revolting to every humane mind, is, after the poor animals are afflicted with a painful disorder, their unfeeling masters too often continue to subject them to hard work while they are labouring under acute suffering. Let any man who has had a severe sprained ankle fancy to himself that he was compelled to carry a heavy burden, or remove a quantity of stones from one part to another by means of a wheel-barrow, or suppose he were even forced to walk at all, and what would be his sufferings ! The probability is, he would be utterly unable to perform one or the other task. But the poor horse has four legs, and probably three of these are sound, and he is thereby not only able to stand, but also to perform progressive motion ; but every time the lame limb is put to the ground and borne upon, his sufferings are equal to, if not worse than what man himself would feel.

It is the interest of every man to have his lame horse rendered sound as speedily as possible ; and this, in most cases, cannot be effected without allowing the animal a cessation from labour ; and it is monstrous cruelty to subject a horse to labour whilst under the influence of a painful malady. The finger of contempt should be pointed at all such unfeeling wretches.

In this portion of the work we shall treat of the diseases alone, and the anatomy of the various parts will be afterwards given, with complete references to the plates illustrative of those parts.

SPRAIN OF THE SHOULDER.

Many ignorant pretenders, who denominate themselves Farriers, frequently speak of what they call the "*shoulder-lameness*," without being able to state wherein this lameness consists. In innumerable instances they are wrong when they say or imagine that the lameness proceeds from the shoulder at all. We are decidedly of opinion that lameness of the shoulder is much less frequent than is supposed.

SYMPTOMS.—To those who have attended to the anatomy of the shoulder of the horse, shoulder-lameness can be recognised with considerable celerity, as well as certainty. The horse generally suffers great pain in moving forward while under the influence of this complaint, which is indicated by dragging his toe along the ground instead of lifting the foot smartly up, which is the natural action in progressive motion ; for it is this lifting of the foot which produces the pain, by giving motion to the muscles of the shoulder, some of which are inflamed and tender, in consequence of the sprain. But it must be obvious to any one acquainted with the anatomy of the shoulder, that the pain occasioned by lifting the foot must be both short and small in lameness of the shoulder, as the limb is allowed to bear the weight a much shorter time than in any other species of lameness. For example, in sprain of the back tendons, it is only when the horse is moving forwards that he suffers much pain, and this is most felt when the weight rests on the leg ; consequently, there is a peculiar activity in moving up the limb in shoulder-lameness the instant the

weight bears upon it. This is strongly manifested in moving down a hill, in which case additional pressure is given to the limb. And while the horse is in the stable, it will be found that his toe only is resting on the ground when afflicted with shoulder-lameness, while in a sound state, he will have the foot flat on the ground. But one of its most prominent characters is, that when the foot is lifted and pressed considerably forward, the animal indicates a feeling of great pain, while the same action will give him no uneasiness if the lameness is seated in the leg or foot.

In diseases or injuries of the muscles, heat generally accompanies them ; but from the muscles which are affected in this belonging to the under layer, of course the heat is not perceptible to the touch. Neither can the swelling be perceived for the same reason.

CAUSE.—This has its origin in some sudden and severe shock which the muscles have received. A slip of the foot or side-fall may also occasion this complaint.

REMEDIES.—External applications in this disease will be of little use, as the part affected is deeply seated. Bleeding from the inside of the arm, that is, from the plate-vein, is the most likely thing to be beneficial, for this reason, that it is the most contiguous to the place which is inflamed. For the same reason, hot fomentations to those parts are most likely to have a good effect, and every care should be taken to prevent the horse from exerting, or even bringing into motion, the muscles affected. But we would not have the owner to expect much relief to be afforded from external applications, as the inflamed parts are so deeply seated as to be beyond their reach. Gentle doses of physic will be useful ; and if the injury remains long, a blister may be applied with probable success.

Numerous ridiculous operations, which only give pain to the horse labouring under this injury, have been resorted to, but all of them are as absurd as they are cruel. The following mild purgative ball may be administered, so as to keep the bowels open :—

Barbadoes aloes . . .	5 drachms,
Castile soap . . .	2 drachms,
Oil of caraways . . .	12 drops.

COMPLAINTS AND INJURIES OF THE ARM.

FRACTURE OF THE ELBOW

sometimes occurs, and when this is the case, it would be exceedingly imprudent for any person to attempt a cure, except one skilled in the veterinary art ; and even with the regular practitioner there is no certainty of a cure being effected. To work a horse for a very long time with fracture in the elbow would be the height of folly, as nothing but long rest, with the use of the sling, are likely to be of any avail.

PUNCTURE OF THE ELBOW-JOINT

sometimes occurs accidentally. Rest is the only thing which can be recommended, and applications to close the wound. This also is not to be trifled with, as in many instances very rapid and extensive inflammation accompanies it, which frequently ends in mortification and the death of the animal.

ENLARGEMENT OF THE ELBOW

may be induced by a severe blow ; or it may be caused by the caskins of the shoes pressing against that part while the horse is asleep with his feet doubled under him.

REMEDY.—Let a seton be carried through the tumour

if it is of small dimensions, and in most cases it will subside completely. But if large, an incision should be made in the skin along the centre of the prominent part, and the tumour removed by dissection.

COMPLAINTS AND INJURIES OF THE KNEE.

BROKEN KNEES.

Much has been said, and a great variety of remedies have been recommended, for injuries received in the knees. It is a subject of very great importance, and therefore much patient attention should be bestowed upon it. Many fine horses have been blemished and disfigured for life by broken knees, and others have been so severely injured that it has rendered them unfit for future service, and in other cases has proved fatal to them.

This injury is generally sustained while the horse is going at a quick pace, consequently the extent of the wound will generally be in proportion to the rate of the speed at which the animal is progressing, and the weight behind, as well as the condition and texture of the road on which he falls. The horse in the action of falling naturally throws his knees forward, and consequently they receive all the weight of both horse and rider, and frequently are very severely lacerated.

REMEDIES.—The first precaution is to wash the wounds thoroughly with warm water and a sponge, so as to remove all dirt and gravel from the parts. The next thing to be done is to examine carefully whether the joint is cut, which is best ascertained by the application of a probe, and if the hard bone is felt by the grating of the instrument, it is certain that the joint is penetrated. But should a doubt remain as to its being so, then a poultice must be applied.

composed of lintseed-meal. This must be allowed to remain for about twelve hours, which will have at least the effect of acting as a fomentation to the wound, and assist in allaying the inflammation. When the poultice is removed, if the capsular ligament of the joint has been injured, then it will exhibit the *synovia*, or joint-oil, which manifests a yellowish, glary, transparent appearance. If a doubt still remains, then a second poultice should be applied for the same length of time. Having ascertained the fact that the joint has been laid open, and the flow of the oily matter continues, and inflammation and gangrene follow, this may to a certain extent be alleviated by washing all round the wound, but not on it, with the following cold lotion :—

Goulard's extract	.	.	2 ounces,
Vinegar	.	.	4 ounces,
Water	.	.	2 quarts ;

to be applied with a sponge, which should always be repeated before any other application, such as a poultice, &c.

Prompt attention must now be paid to closing the wound, an operation which is only fit for the skilful hand of a regular veterinary surgeon. But in cases where a veterinary surgeon is far off, or cannot be had in proper time, the closing of the wound may be effected by a compress enveloping the entire wound, and allowed to remain at least fourteen days before it is removed. It must, however, be borne in mind that wounds from contusions of the kind mentioned are very different from a simple cut ; as the edges are irregular, and there is a consequent loss of substance, which can only be restored by the tedious process of granulation. It must therefore be evident that the less action in the limbs the better, as if those tender, new-formed portions are either stretched or bruised, it protracts the cure.

If the cut in the joint be large, and the joint-oil continues to exude from it, and the horse exhibit symptoms of suffering much pain, it may be considered that the wound has become incurable ; and under the circumstances, it will be but proper to destroy the animal, and relieve him from the torture which always accompanies aggravated cases of broken knees : for high fever is almost always induced, of which he is nearly certain to die ; or if he survives it, the inflammation of the parts will induce a deposit of matter in the cavity of the joint, and this becoming fixed, produces lameness, for which there is no remedy.

To enable a person to judge of the exact situation of the wound in broken knees, he should have a thorough knowledge of the structure and situation of the bones of the knee-joint, which is the most complicated of all the bony structure of the horse. Between the lower termination of the bone of the arm, and the superior portion of the leg-bones, there are interposed seven other bones, called the carpal bones. Six of these are arranged in two rows of three each, and the seventh is placed behind the others. Should the wound be situated opposite the bottom row, and if its dimensions are small, then there will be little difficulty in closing it ; and even a pretty large one is frequently successfully cured, as there is but limited motion in that part. But if it is situate opposite the union of the two rows, its remedy is much more uncertain, in consequence of this being the seat of the chief motion of the joint, which has a tendency to disunite the lips of the wound, and also induces most irritating friction between the bones, which would become in close contact with each other, in consequence of the expenditure of the joint-oil.

When the skin has been broken, it is always visible afterwards, but the extent of the blemish will depend

greatly upon the treatment of the wound in its early stages. Caustic applications should invariably be avoided, as they always leave behind them a greater blemish. But should the mark left be of some extent, even without using caustic remedies, then the best way to render it less visible is to apply a mild blister to the part, which will stimulate the hair to shoot out more abundantly round the scar. We do not think there is much faith to be placed in the application of ointments, except they may be stimulating, in consequence of being generally composed of turpentine or Spanish flies.

It is seldom a knee that has once been broken, is so healed as not to be perceptible, although in some cases the hurt has been so slight that it can hardly be detected. But even in the least visible of these the hair is always slightly curled, and where this is noticed, the leg should be taken up and the knee bent, when the scar, however slight, will be at once perceived. But we would not have it supposed that a broken knee is invariably an indication of a stumbling animal, because the best of horses have come down, by being backed by a bad rider, or placing his foot on a rolling stone on a road when going at a quick trot, or other cause. However, a broken knee once detected will put the purchaser upon his guard to watch minutely the action and paces of the horse, as well as the form of his fore-quarters; because, if his shoulder is thick and upright, and the legs placed far under him, then he is likely to have a bad action, and be apt not to lift his feet high enough to clear the ground properly. On the other hand, I knew one of the finest hunters that ever took the field, with his knees broken, from his rider having forced him to a leap which it was impossible he could accomplish. If the shoulder is oblique and the withers high, with a strong,

well developed fore-arm, it may be fairly inferred that he has come down from some accidental cause.

SPLINT, OR SPLINT.

A splint is an enlargement, or bony excrescence, of some part of the shank-bone, generally in the higher portion of it, and situate in the inside of the leg (plate 6, fig. 1.) This is a complaint to which young horses are most liable ; and it has been generally remarked, that as horses advance in years they gradually diminish, and not unfrequently disappear altogether. It seldom happens, unless the splint is tolerably large, and encroaches too much upon the knee-joint or the back sinew, that it is productive of lameness, unless the horse happen to strike it with the foot of the other leg. In other instances a splint not larger than a pea may be detected in consequence of being acutely sensitive, and produces such lameness as, without being experienced in this complaint, might lead to the belief that it was quite disproportionate to the cause.

CAUSE.—It is difficult to conceive how splint should appear on the outside of the small bones, except we suppose that the space between these bones is occupied by mechanism of an important character. It is much easier to account for their almost exclusive appearance on the inside of the limb. The inner splint-bone is situate nearer the central part of the body than the other ; and from the nature of its connexion with the knee, it is subject to a greater proportion of weight than the outer one, and hence is more liable to injury and inflammation, and consequently inducing this bony deposit, which has been termed splint. The inner bone supports the entire weight, which is transmitted to one of the small knee-bones. It is the only support of that bone, while but a portion of the weight is sustained by

the outer splent-bone, and the pressure is divided between it and the shank-bone. Besides, many smiths who are imperfectly acquainted with their profession, most absurdly elevate the outer heel of the shoe to a great degree, which throws an additional quantity of the weight of the animal on the inner splent-bone. Severe blows sometimes occasion splents on other portions of the shank-bone.

During the formation of a splent, the horse is frequently lame, occasioned by the periosteum, or membrane which covers the bone, being stretched to an unnatural degree, and causing great pain to the animal in consequence of the sensitive nature of that membrane. But when it has been so stretched as to accommodate itself to the form of the tumour causing the splent—unless it be in a situation which comes in contact with the tendon—the lameness will disappear; or a slight inflammation may be induced by the pressure above referred to.

Properly speaking, in most instances splents cannot be called unsoundness, as it is possible they may not at all interfere with the action of the horse, and in that case they will not depreciate its value. This, of course, depends much upon the situation in which the splents are found.

REMEDIES.—When it is noticed that a splent is forming, which generally commences with a tumour, the hair should be shaved off all round it, and a small portion of mercurial ointment rubbed into it for two or three days, and after this a pretty strong blister should be applied. If these do not stop its progress, the cautery is sometimes used; although we would recommend that this should not be resorted to, except where the splent threatens to be large, and is making evident progress after the above remedies. It often happens that the effects of the mercurial ointment and blister do not manifest themselves at first; but after some little time

the splent will begin to lessen, and eventually disappear altogether. In fact most splents disappear by absorption when the horse begins to get old.

SPEEDY CUT.

This is an injury inflicted on the inside of the leg, just below the knee-joint, and extending to the head of the inner splent-bone. Horses of high action are liable to this injury, by severely striking this part with the edge of the shoe when they are trotting at a speedy rate. This, in some instances, occasions a bony enlargement, and in others considerable tenderness and great heat in the adjacent parts. Sometimes the pain inflicted is so great that the horse will suddenly drop as if life were extinct.

REMEDIES.—The only thing required is to prevent the shoe from extending beyond the hoof; and the shoe should have only one nail on the inside of the foot, and that placed near the toe. Let the shoe also be of equal thickness at the heel and toe, and formed so that the foot may bear equally on both sides.

KNEE-TIED.

In some instances, when the *trapezium* or hinder bone of the knee is not sufficiently prominent, the ligamentous ring by which the tendons are bound together, will confine the flexor tendons of the foot so tightly that the leg will be very deficient in depth under the knee. This is known by the phrase, that the horse is “tied below the knee.” This defect has always been found to limit the speed of the animal, as well as its endurance. If such a horse is ridden either fast or far, he is almost certain of being seized with a sprain of the back sinews. This is caused by the pressure of the ring producing such a degree of friction as will

militate against the free action of the tendons, and thus requiring a greater degree of exertion to keep up progressive motion. This will be the case, even with the best horse, otherwise well formed, and who has a complete degree of muscular development; which by a continuance of the pressure and action must strain the tendons. But this is not all: when the back tendons are thus bound down, they are squeezed into a more oblique direction, consequently it requires a greater force to make the muscles act, and fatigue is induced in a shorter time, and it is almost always accompanied by a sprain. In short, it is one of the worst defects incidental to the horse.

SPRAIN OF THE BACK SINEWS.

The back tendons are enclosed in a sheath of thick cellular substance, which not only protects them from injury, but also keeps them in their proper situation. To prevent friction, a mucous fluid intervenes between the sheath and the tendon. When the horse has been over-exerted, or over-worked, the tendon presses upon the delicate membrane with which the sheath is lined, and induces inflammation. This creates the secretion and discharge of a different fluid, which becomes coagulated, and the consequence is, that adhesions are formed between the sheath and tendons, which render the motion of the limb more difficult and cause pain during action. Long-continued action will also sometimes rupture some of the fibres with which the tendons are bound. This is what has been termed a sprain of the back sinew, and when this takes place to a greater extent, the horse is said to have *broken down*. So that, in point of fact, there is no rupture of the tendon itself, as it cannot be sprained, not being elastic or capable of extension.

SYMPTOMS.—It will be seen that during every movement

of the limb the animal evinces great pain, in consequence of the excessive inflammation which accompanies this injury, and also the considerable local swelling and heat which accompany it. The horse will also stand with his foot off the ground, barely touching it with his toe. The first injury which is above pointed out consists merely of inflammation of the sheath, or partial rupture of the fibres by which it is attached.

REMEDIES.—To prevent constitutional irritation, bleeding should immediately be resorted to, and afterwards doses of the following given :—

Barbadoes aloes	.	.	1 $\frac{1}{4}$ ounce,
Calomel	.	.	2 drachms,
Jalap	.	.	$\frac{1}{2}$ drachm ;

to be administered in the form of a ball.

In this case the bleeding may be from the toe, which will relieve the vessels situate near the injury, and check the fever also. The bleeding should be performed in the following manner :—Let the sole be well pared down, and when sufficiently thin, let a groove be cut with a small drawing-knife, at the place where the crust and sole unite, (see plate 6, fig. 10, *w*.) This will open the great vein ; but should it not hit upon the vein, the groove should be extended backwards until it is met with ; and when the blood begins to flow, the vein may be further enlarged by a small lancet, inserted horizontally under the sole, by which means any quantity of blood may be obtained. The foot should then be placed in warm water, which will induce a more rapid flow of blood ; and when enough has been taken, insert a small quantity of tow into the slit, and let the shoe be put on again very slightly. When this has been accomplished, the wound will speedily heal.

After this the limb should be well fomented with warm

water three or four times a day, each time for about an hour; and in the intervals let large poultices of lintseed meal be wrapped round the leg. A little of Goulard's extract, or vinegar, may be added to the poultice with advantage. A great deal depends, however, on the warmth and moisture of the poultice, as well as the fomentations. These appliances are intended to allay the inflammation. Stimulants are to be carefully avoided, as these are sure to increase the inflammation.

When the horse begins to rest his foot upon the sole, and the heat has left the part, it is certain that the irritation will have considerably abated. But although this is the case, means must be used to prevent the recurrence of the inflammation, and also to reduce the swelling. Apply a thin flannel bandage to support the parts, which, by gentle pressure, will have a tendency to stimulate the absorbents, and promote the absorption of the coagulated matter which caused the complaint; and it should be applied tighter as the limb will endure increased pressure; and this appliance should be continued for at least fourteen days. It will be better to keep the bandage wet with the following lotion:—

Vinegar 1 pint,

Spirit of wine $\frac{1}{4}$ pint.

This will have the effect of reducing the deep-seated inflammation.

If in a fortnight all the symptoms have disappeared, the horse may be put to work, but of course with caution. But if after this time lameness still continues, then recourse must be had to a blister; and in this case it will be proper afterwards to turn out the horse for a month or two to allow proper time and opportunity for the reduction of the swelling and inflammation, otherwise an incurable lameness may be the result.

Severe sprains, as well as those which have been unskilfully treated, especially where from long-continued inflammation the structure of the part has been considerably altered ; or if the swelling has become callous, and the skin thickened so as to prevent the free action of the limb, then it will be necessary to use the cautery, as the best means of rousing and stimulating to action the absorbents, so as to enable them to take up the coagulated deposit, as well as the thickened skin and unusual increase of the cellular substance.

In firing, the cautery should be applied in straight lines so as to contract the skin, and by its natural elasticity to produce that pressure so necessary in this complaint.

It may well be imagined that it will require some time before this hardened fluid can be removed, not less than six months cessation from work will suffice. A blister applied six weeks or two months after the use of the cautery is frequently attended with beneficial effects ; but it should never be had recourse to except in cases where it becomes indispensable ; and these are generally from unskilful firing.

It is necessary to pay very strict attention to the appearance of the flexor tendons in the purchase of a horse ; and if there is any thickening of the cellular substance, then it may be inferred that the horse has had one of those sprains, and that it has not been properly managed. The action of the horse is sure to be affected by it, and a return of the malady may occur ; and although all appearance of lameness has left the animal, still he cannot under such circumstances be considered a perfectly sound horse.

WIND-GALLS.

SYMPTOMS.—Wind-galls more frequently occur in the fore than in the hind legs. These are known by the puffy

Try from Po, well

Finely Poud Bi-oxide { 3j
of Mercury
rubbed with Hog's Lard 3j

Iodine ointment of ~~equal~~adequate
strength. or

Iodine + Mercuric ointment
equal parts —

appearance so frequently noticed about the legs of horses which have been hard worked. (See plate 6, fig. 8, c.) There is a beautiful provision in Nature, in placing little bags between the tendons and other parts where they are exposed to pressure or friction. These sacs contain a mucous fluid of a similar kind to the *synovia*, or joint-oil which oozes from the bags and lubricates the tendons of the muscles. In consequence of violent action and straining the tendons, these bags get injured, become inflamed, swollen, and hard, the tendons being generally inserted near the joints, where there is more pressure and motion, and consequently these bags are more liable to injury. They become inflamed, and during this state the horse is generally lame to a greater or less degree. However, unless these sacs attain a very large size, the horse cannot be reckoned unsound, as few are entirely free from wind-galls, —which appellation they acquired from the fancy that they contained wind.—It was an old practice to cut or probe them, so that the air might escape. This has, in many instances, produced violent inflammation, and has been the death of many fine horses.

REMEDIES.—Unless wind-galls are large and interfere with the actions of the leg, we would recommend that no treatment should be attempted. The first appliance to a large wind-gall should be a bandage or roller of flannel, and under it, immediately over the swollen parts, a soft pad should be introduced, and firmly bound down. The bandage should be wetted with the same kind of lotion recommended in sprain of the back sinews, page 101. This treatment in most instances will cause the wind-galls to disappear; but unfortunately they are liable to return, especially if the animal is hard worked. A blister is more likely to effect a cure, as it generally has the power of

dispelling the swellings. Firing is still more effectual in large galls, as it immediately induces absorption of the fluid, and consequently the swelling disappears, by means of the contraction of the skin caused by the use of the cautery ; and this contraction serves the purpose of a permanent bandage, and prevents a recurrence of the wind-gall.

RUPTURE OF THE SUSPENSORY LIGAMENT.

Extraordinary exertion will sometimes produce rupture in the suspensory ligament, (see plate 6, fig. 10, *f*.) This relaxation allows the sessamoid bones to fall down, and consequently the fetlock joint nearly touches the ground. It not unfrequently happens that this complaint is mistaken for rupture of the flexor tendons ; but one thing will render it sufficiently evident that it is really the suspensory tendon which is at fault, namely, that the horse is able to bend his foot. No malady which affects a horse is more serious than this ; for it is ten to one that the animal ever becomes effectually cured of it. In most instances he is ever afterwards lame.

REMEDY.—If a cure can at all be effected, it will be by keeping the animal quiet, and having the leg bandaged and giving him a high-heeled shoe.

GROGGINESS.

This consists of a singular knuckling over the fetlock-joint, and general shaking over the entire fore-leg. It is a complaint common to old, over-worked horses. Neither the fetlock or pastern joints are simply implicated in this complaint, although both are connected with it.

CAUSE.—Working the animal beyond his strength is usually the sole cause of this complaint. It is for the most part a want of power in the ligaments of this joint, gene-

rally occasioned by frequent and severe sprains, brought on by cruel and oppressive treatment, in forcing the animal to pull more than his physical energies can accomplish. without a desperate effort.

REMEDIES.—It seldom happens that an effectual remedy can be found for this complaint, because it is generally accompanied by ulceration within the joints, as well as of the membrane with which the cartilage is lined ; and even the cartilage itself is affected, which is inaccessible to any remedial treatment.

SPRAIN OF THE FETLOCK.

The fetlock-joint is peculiarly liable to injuries, from its being the principal situation of action below the knee. In sprains of the back-sinew, accompanied by inflammation, which is usually the case, inflammation is generally induced in this also. And many of the sprains which are supposed to belong to higher portions of the limbs are, in fact, affections of this joint.

SYMPTOMS.—It is no easy matter to distinguish affections of the fetlock from those situate in the superior portions of the limb. Pressure by the finger on the part, and heat, are the surest tests for finding out the seat of this complaint.

TREATMENT.—Strong blisters applied with promptitude are the most effectual means of removing sprain of this joint ; and afterwards bandages of flannel should be used.

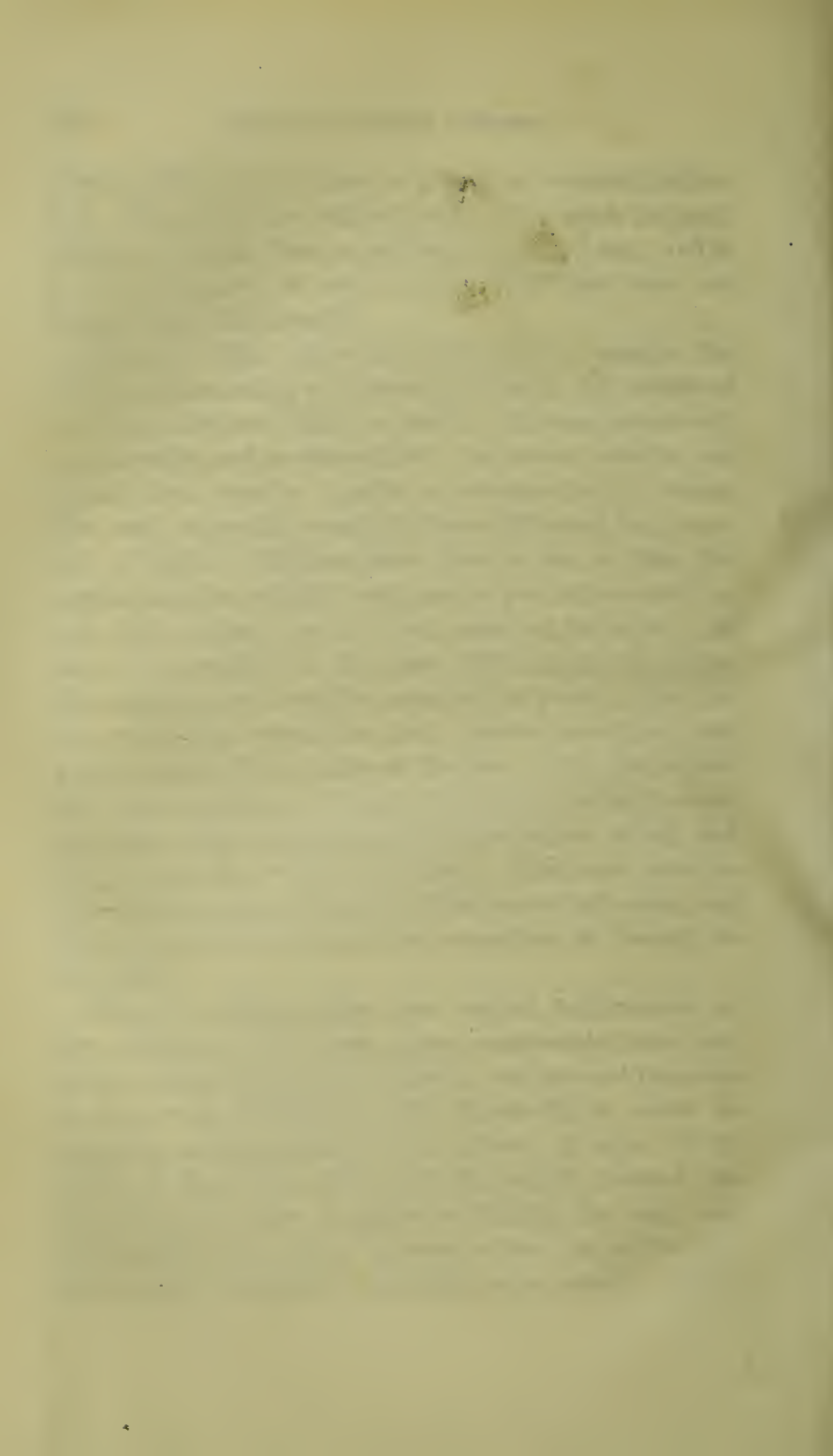
CUTTING OF THE FETLOCK.

The inside of the fetlock-joint is frequently bruised or cut by the shoe of the opposite foot. This depends sometimes upon natural defects in the form of the leg and foot ; and in such a case it is seldom that a remedy can be devised ; such as when the limbs are placed too near each

other, or when the feet have an inward or outward inclination. Some horses are subject to this when much fatigued, arising, no doubt, from a relaxation of the joint; and it is not unfrequent for colts to cut when they have not attained their full strength.

REMEDIES.—Many plans have been tried to remedy this defect, such as raising or lowering the inside and outside of the heel, as the case might require it. In some instances it has succeeded, and in others failed. In fact no principle can be laid down whereby to guide an operation for this defect. The most successful remedy hitherto discovered is to use a shoe of uniform thickness from heel to toe, so that the bearing may be perfectly level, and to put but one nail in, and that situated near the toe, inside of the shoe; this shoe to be applied to that foot which strikes the other. The greatest care must be exercised to prevent the shoe from extending beyond the hoof, besides having the crust a little rasped off the inside of the hoof. This part of the hoof being destitute of the nails will expand when it comes in contact with the ground, and contract when raised, and relieved from the weight of the body. Great care must be taken that the shoe be equal in thickness on both sides, and also at the heel and toe, so as to equalize the bearing on both sides.

When the defect arises from natural malformation of the setting on of the feet, many experiments have been tried to remedy this, as above stated; but the most ingenious of these were instituted by Mr. Moorcroft, by which he adopted a contrary practice to that above; he says, "If the inside of the foot be raised, and the outside lowered, the supporting leg when in action will bring the body, and consequently the moving leg more to the side of the supporting leg, and hence more liable to be struck. On the



other hand, if the outside of the foot be raised, the supporting leg will throw the body off that leg, consequently the moving leg will be further off the supporting leg, and hence less liable to strike." These arguments are good ; but still there have been cases where the practice of these suggestions has failed to produce the desired effect.

But cutting does not always arise from natural defects, as it is often the consequence of unskilful shoeing. When this is the case, we usually find the upper edge, or that part which comes in contact with the crust, to be hammered inwards, leaving the lower edge on the ground side wider than the hoof, and projecting beyond it.

In purchasing a horse which manifests marks of cutting or callous thickening on the inside of the fetlock, it is safest to avoid the purchase, as it is most difficult to ascertain the true cause by inspection, unless the throwing outwards or inwards of the toes be considerable. Besides, as above stated, some horses will cut when tired, and others from a weakness of the fetlock.

SPRAIN OF THE COFFIN-JOINT.

This disease is indicated by a sudden lameness ; and a considerable heat exists round the coronet, as well as tenderness, which gives the animal pain when pressed upon. Sprain of the coffin-joint sometimes becomes a very bad complaint, in consequence of its being so often unobserved by grooms or even farriers, and it becomes deeply rooted before it is detected. Above all others, this complaint is frequently confounded with lameness of the shoulder.

REMEDIES.—The first thing to be tried is bleeding at the toe ; and afterwards a blister should be applied, and at the same time the animal should have occasional doses of physic. The following laxative may be given :—

Barbadoes aloes	.	.	1 $\frac{1}{4}$ ounce,
Calomel	.	.	2 drachms,
Jalap	.	.	$\frac{1}{2}$ drachm ;

to be given in the form of a ball.

RINGBONE.

This is one of the worst species of lameness which is incidental to the horse. Whenever it exists, even in the slightest degree, it comes under the character of unsoundness, because it is so liable to increase ; and when the bony deposit begins to enlarge, the lameness becomes incurable. This complaint commences in one of the pasterns, and usually near to the joint. It is liable to spread rapidly, affecting not only the pastern bones, but also the cartilages of the foot. When the first deposit is on and surrounds the lower pastern, emanating from a violent inflammation of the ligaments, a small enlargement or bony process is to be perceived immediately above the coronet. (See plate 6, fig. 8, *δ*.) The hind feet are most liable to this complaint, as they are subjected to the greatest stress in the force required by them to propel the horse, and in this case the back part of the foot is most liable to be affected. But the disease is not of so serious a nature, being chiefly confined to the ligaments, and the bones have not been injured by concussion, to which the fore legs are peculiarly exposed ; consequently, in them, diseases of the bones generally accompany ligamentary lameness.

REMEDIES.—In the early stages of this complaint, when even a bony enlargement is visible on both sides of the pastern joint, or on one side only, and the enlargement is of but small extent, then there is a probability that it may be removed by the application of an active blister, or by the use of the cautery. But owing to the extreme

action of these joints, the inflammation and the bony secretion rapidly spread. The pasterns, in the first instance, become connected together by this bony process, which supplants the ligaments, and then the joints become immovably fixed, or what is technically termed anchylosed. From this joint the disease is carried to the cartilages of the foot, and to the union between the lower pastern, as well as to the coffin and navicular bones, which either impedes or totally destroys all action in these parts, and this part of the foot becomes an entire mass of spongy bone.

OSSIFICATION OF THE BACK SINEW.

Ossification of the back sinew is very easily distinguished. When a healthy sinew is pressed upon with the thumb and two first fingers, from above downwards, it feels like a very tense cord, yielding slightly under the pressure, but springing back to its natural position the moment that pressure is removed. When the sinew is ossified, it is divested of that elasticity so obvious to the touch of even the most inexperienced. It is true that in its incipient state it is not so readily discovered, as its bony texture has not been fully formed, although an expert veterinary surgeon will be able to detect it soon after it has begun to form. In the earlier stages of ossification of the back sinew, no lameness takes place, but it is certain to render the horse lame eventually, and that, too, for the remainder of his life. There is no remedy for this infirmity.

CURB.

This is a swelling below the hock, caused by hard work and by the animal being overloaded ; and sometimes occasions lameness. It is most common in cat-hammed, high-bred horses, especially when young ; and is caused by leaping

before the animal has acquired its full strength. It is more visible when the limb is viewed sideways ; and by comparing it with the sound one, the extent of the evil will be the more observable. This swelling is unaccompanied with heat.

REMEDY.—The use of the cautery is the only remedy, and it should be promptly applied. After this recourse must be had to the following lotion :—

Goulard's extract	.	.	2 ounces,
Vinegar	.	.	4 ounces,
Water	.	.	2 quarts.

Keep two or three folds of cloth well wetted with this for some days to the part affected, until the swelling entirely disappears.

CHAPTER VI.

THE HAUNCH AND OTHER PORTIONS OF THE HIND LEGS.

FRACTURE OF THE TUBEROSITIES OF THE HAUNCH.

THE only portions of the haunch or *pelvis* which are liable to injury or fracture are the tuberosities on the points of the various bones. It sometimes happens that those parts are fractured by a fall or heavy blow. When such is the case, the horse will walk lame, and swelling will take place in the contiguous parts, with a degree of heat, as inflammation is always an accompaniment of fracture. There are no mechanical means of bringing those parts together, to force a reunion and place them in their natural position ;

so that all we can do is to allow Nature to work her own cure. A large and strong adhesive plaster may be laid across the haunch, which will, in some measure, assist in keeping together and supporting the parts. It seldom, however, happens that the parts again adhere in their natural position, consequently deformity and lameness are entailed upon the animal for life.

SPRAIN OF THE ROUND BONE.

SYMPTOMS.—The rounded termination of the *femur* or thigh-bone is in common language termed the round-bone. In a few isolated cases this part has been dislocated, and the rounded part which fits into the cavity of the hip-joint is fractured; but sprain of this part is more commonly the case. The indication of this is, that the horse drags his leg after him, with the toe only touching the ground as he walks. If the bone itself has been injured, heat and tenderness of the part will generally be manifested.

REMEDIES.—It seldom happens that strains of this joint are immediately relieved; and from the want of proper action the muscles of the limb waste away. A blister is the most likely thing to be of use, and the horse should not be subjected to any kind of work. Firing has sometimes relieved the complaint. Should this fail, the only thing that remains to be done is to put a *charge* over the joint, and turn the animal out to grass for some months.

SPRAIN OF THE STIFLE-JOINT.

It is but seldom that this joint is sprained. When it does happen, heat and tenderness of the part will give an indication of it. Sometimes dislocation of the patella, or small bone, answering to the knee-pan in man, occurs.

This will be indicated by the horse dragging the limb after him, or by his resting it on the fetlock-joint. The muscles of the inside of the thigh are sometimes sprained, which is known by the heat in all the contiguous parts.

REMEDIES.—For dislocation of the patella, the aid of a veterinary surgeon will be absolutely necessary. In case of muscles being sprained, fomentations must be used ; and bleeding in some instances may be necessary, accompanied by doses of laxative medicine, as recommended at page 132.

THOROUGHPIN.

In treating of wind-galls, we described certain little bags or sacs, containing a fluid for lubricating the joints. These, we mentioned, sometimes become inflamed and enlarged : similar sacs are situated contiguous to the hock-joint, and these also are liable to inflammation, and produce swellings of greater or lesser dimensions immediately under the strong tendon which unites with the cap of the hock. These swellings generally protrude on both sides, in the form of round swellings. Sometimes when the coverings of the tumour yield more readily in one direction than another, it will protrude principally in that part. The nature of the complaint is precisely the same as wind-galls, but from its situation has been termed thoroughpin, (see plate 7, fig. 3, *ee*, and 5, *bb*.) These swellings generally produce stiffness of the joint, which sometimes wears off when exercise has induced absorption of the fluid which these bags contain. However, it is only when the sacs become large that they occasion any inconvenience to the action of the limb. Many persons think thoroughpin of but little consequence ; but after a hard day's work, a horse will always manifest stiffness in the joint in which these swellings exist. And although a horse cannot strictly be called unsound which is afflicted

with thoroughpin, still a purchaser, when he notices these, should otherwise examine the horse with care, to discover, if possible, that they have not been induced by previous hard work, which will sooner or later tell on the animal.

TREATMENT.—The same remedies as recommended in wind-galls are applicable to this complaint. But there is no certain cure, and hard work is almost certain to make them re-appear.

CAPPED HOCKS.

Capped hocks consists of a swelling on the very point of the hock-joint (see plate 8, fig. 4, *a*.) The tumour is soft and fluctuating, caused by an enlargement of one of the mucus bags described in wind-galls and thoroughpin. Lameness seldom accompanies capped hock, but nevertheless it is an awkward complaint, particularly in draught-horses, in consequence of this part being very liable to come in contact with the bar of a gig or carriage; and by causing pain to the animal, induces him to kick, and, if a high-tempered horse, often causes much mischief. It is generally produced by blows of some kind; but in many instances the injury is inflicted by the horse himself in kicking, and that when the animal is in harness, although some are in the habit of kicking while in the stall. It also occurs sometimes by the bedding of the horse being too thin, and the hock may be bruised in consequence, and it may besides proceed from a sprain of the hock-joint.

TREATMENT.—Blisters are the only means that can be employed with the hopes of removing the swelling, and it often happens that these must be frequently repeated before a cure can be effected. Sometimes the swelling disappears without any other means than rest being employed. But often capped hock becomes of a very large size, and callous

in its structure, in which case we are not aware that it can be eradicated.

In purchasing a horse which exhibits capped hock, the whole of the part should be very carefully examined, in order to ascertain if there are any other bruises observable. His history should be obtained, if possible, and learn whether it has been the result of kicking. Horses that are given to kicking can seldom or never be broken from the habit.

MALLENDERS AND SALLENDERS.

These are scurfy eruptions, situate in the inside of the hock, a little way under the knee, sometimes even on it: the former appellation is given to those of the fore leg, and the latter to the hind leg. These seldom are accompanied with lameness, but if not attended to in time, they will ulcerate, when a thin watery humour will issue from them, which becomes difficult of cure.

REMEDIES.—The following ointment must be applied to the parts affected :—

Common tar	.	.	.	1 ounce,
Sugar of lead	.	.	.	$\frac{1}{2}$ ounce,
Lard	.	.	.	4 ounces.

If the above does not stop the discharge in a week's application, then recourse must be had to the weak mercurial ointment.

During the treatment of this complaint, the following laxative ball should be occasionally given :—

Barbadoes aloes	.	.	5 drachms,
Castile soap	.	.	2 drachms,
Oil of caraways	.	.	10 drops.

The cause of this complaint is in general owing to bad stable management.

THE HISTORY OF THE UNITED STATES

The history of the United States is a subject of great interest and importance. It is a subject which has attracted the attention of the whole world. The history of the United States is a story of the growth of a great nation from a small colony of English settlers. It is a story of the struggles of the people for freedom and independence. It is a story of the development of a great republic. The history of the United States is a story of the triumph of the people over the forces of tyranny and oppression. It is a story of the establishment of a great nation which has become a model for the whole world. The history of the United States is a story of the growth of a great nation from a small colony of English settlers. It is a story of the struggles of the people for freedom and independence. It is a story of the development of a great republic. The history of the United States is a story of the triumph of the people over the forces of tyranny and oppression. It is a story of the establishment of a great nation which has become a model for the whole world.

CHAPTER I

The first chapter of the history of the United States is the story of the early settlers. It is a story of the struggles of the people for freedom and independence. It is a story of the development of a great republic. The history of the United States is a story of the triumph of the people over the forces of tyranny and oppression. It is a story of the establishment of a great nation which has become a model for the whole world.

ENLARGEMENT OF THE HOCK.

The origin of this is a sprain or inflammation, affecting generally the hock-joint, produced principally from some sudden or violent concussion ; checking the horse abruptly when going at a rapid pace, or from the animal being compelled to draw a greater weight than his strength will enable him to do comfortably. Considerable lameness, with tenderness of the parts, always accompany this ; but these are not so difficult to remove as in more limited inflammation. It will yield to rest and fomentation in general ; but, if not, it will be necessary to have recourse to firing, which generally proves effectual. However, it too frequently happens that the enlargement of the whole joint remains. But this will not incapacitate him for work ; and if treated with ordinary caution, he may be worked during the remainder of his life without any increase of swelling or inflammation returning, although the parts around the hock-joint are altered in structure, and to a certain extent weakened. Although a horse may never afterwards exhibit lameness, still, where permanent swelling of the hock-joint exists, he is, in point of fact, regarded as unsound ; because, if he happen by necessity or accident to be subjected to extra hard work for a day or two, he is almost certain to become lame, and that too for life. Still, however, many a good and useful horse has enlargement of the hock.

CURB.

A curb is situated some inches below the point of the hock, (see plate 7, fig. 3, *a*, and fig. 8, *e*,) and is an enlargement of the ligamentary bands of the part. When the limb is viewed from the side, a gradual puffing out of this part will be observable ; and if it is at all large or inflamed,

it is sure to be followed by lameness. If heat and tenderness of the part are perceived, and the horse is lame, it is certain that it has its seat in this spot.

The cause of curb, like other injuries of the hock-joint, proceeds from a sudden check, or over-exertion, and inducing extension of the ligaments, which bind down the tendons; or it may proceed from an injury sustained by the sheaths of the tendons. This brings on inflammation, and frequently lameness ensues. It is most common to young horses, especially those which are cow-hocked; that is, with the structure of the hock and leg being like that of a cow, the hocks having an inward inclination, and the legs exhibiting a considerable outward angle. This formation of the limbs, it will be at once perceived, has the effect of inducing a continual stretch on the annular ligament, and thereby confining the action of the tendons.

When curb first appears it is generally accompanied by swelling and lameness: it is seldom, however, that the swelling is great, exhibiting generally a gradual curve, so little to be noticed that, when viewed from behind, it cannot be observed.

REMEDIES.—The first application should be cold evaporating lotions, frequently used. These to consist of

Spirit of wine	.	.	.	2 ounces,
Vinegar	.	.	.	2 ounces,
Water	.	.	.	2 ounces.

This to be often applied until the inflammation has subsided. Should the heat and lameness continue, bleeding from the subcutaneous vein must be had recourse to, the situation and course of which is exhibited at *k*, plate 7, fig. 2. After which purgatives must be administered. The following should be made up in the form of a ball, and given:—

Barbadoes aloes	.	.	5 drachms,
Castile soap	.	.	3 drachms,
Oil of caraways	.	.	12 drops.

If the complaint has its seat in the annular ligament, or in the sheath of the tendon, very active treatment becomes necessary to effect a permanent cure. Blisters will be found the most effectual. First, a liquid one should be tried, such as the following :—

Tincture of cantharides . 1 ounce.

This to be applied every day until considerable swelling is induced, after which let it subside to some extent, and again have recourse to the cooling lotion. If this does not thoroughly disperse the curb, then the hair should be shaved off the part and a regular blister applied, and repeated from time to time until a cure is effected. In very severe cases of curb, it has been necessary to have recourse to firing, after all other measures have failed.

Long-continued rest is absolutely necessary in cases of curb, without which the lameness is liable to return upon the horse being worked.

Horses that have, or have had curb, are decidedly unsound ; as this serious complaint always leaves weakness behind, and a return of it is almost certain for a very long period after an apparent cure.

STRING-HALT.

This complaint consists of a convulsive or twitching action in one or more of the legs, and so evident that it is perceptible to any one, however inexperienced he may be in the action of horses. It is a complaint almost always confined to the hind legs, although in a few solitary instances it may be met with in the fore limbs. This com-

plaint is first noticed when the horse is just taken out of the stable. The animal lifts his leg high, suddenly elevating it towards his belly, and puts it to the ground with considerable force. Should both limbs be affected, then it gives the appearance as if the horse had very good and high action in his hind limbs, and many a purchaser has been deceived in consequence. This shows the utility of all possessors of horses having a general knowledge of the complaints incidental to this useful animal. Stringhalt soon disappears after the horse has been heated a little, and it is no detriment to him after he has been warmed; for we have seen and ridden some of the best of hunters which have had that affection, and which were first in at the death.

We are not in possession of any means for the remedy of this affection; and although it is unpleasant to the rider upon first setting out, yet it is no positive detriment to the animal, nor is it reckoned unsoundness. Indeed the true nature of the affection is not known. By some it has been supposed to exist in the spinal marrow, and by others to be situated in the nerves supplying some of the muscles of the leg.

BONE-SPAVIN.

A bone-spavin is an increased growth of bony consistence situated on the lower and most prominent part of the inside of the hock-joint. (See plate 7, fig. 9, *d*.) A well-formed hock-joint gradually tapers down so as to unite almost imperceptibly with the soft or fleshy parts. In examining a horse, the hand should be passed over the inside of the hock in a downward direction, when horses having this injury will be found to have a little prominence, near the lower point of the bone. This is an enlargement of

Remarks from Percival on discovering Spavin -

2 kinds of Spavins - Pericardial
& Articular -

1st A recent case of Spavin &
one occurring for the first time -
not a relapse - is presumably
Pericardial & more certainly exostosis
accompanies or precedes the lameness -

2nd Heat & tenderness in the tumor
is certain Pericardial -

3rd Altho no exostosis ~~heat or~~
perceptible we are not to
conclude it is not Pericardial
as it frequently happens there
is soon exostosis & exostosis
may exist without us being
able to discern from the situation.

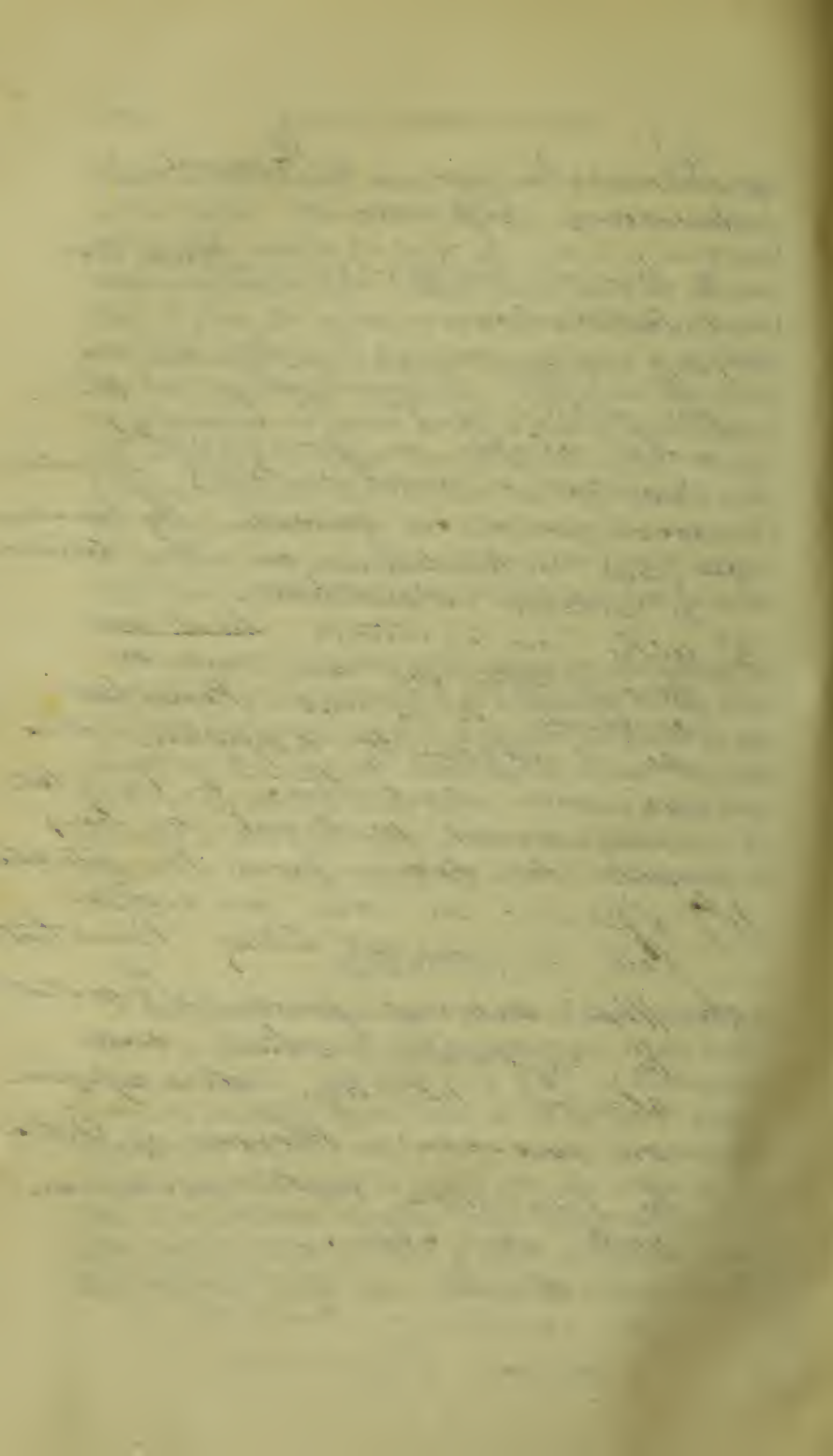
4th Spavin in an untrotten
Colt is most likely Pericardial

5th When arising from Pericardial
the inflammation will
almost always disappear
on quiescence; Whereas if Articular
the lameness will increase
with exercise. -

Blister

Pot. Chloride of Mercury &

Venous Emulsion



the bone, and what is termed bone-spavin. It is a disease of the inner splint-bone, and serious in its nature and effects.

The true nature and causes which induce bone-spavin cannot be properly understood without a thorough knowledge of the hock-joint, which we have represented on plate 10, fig. 8. In this figure the shank-bone is represented at *b*, and the two small bones behind at *g* are the splint-bones; these support the lower layer of the bones of the hock. The cube-bone, *f*, rest chiefly on the shank-bone, and in a slight measure on the outer splint-bone. The middle wedge-bone, *e*, rests entirely upon the shank-bone, and the smaller wedge-bone rests in a slight degree on the shank-bone, but its chief support is on the inner splint-bone. From this arrangement the splint-bones support a very unequal degree of weight and concussion. The inner one is placed more under the body, and consequently nearer the centre of gravity, and besides nearly the entire weight and concussion is communicated to the little wedge-bone. Hence it is that during any violent action of this joint either in leaping, galloping, or under the pressure of a heavy draught, the inner splint-bone or its ligaments are injured. This is more especially the case with young horses before their joints have become firmly consolidated.

The shoeing blacksmith or farrier too often is the cause of inducing and increasing this complaint, by improper treatment of the feet. An erroneous notion has too long prevailed among smiths that cutting and wounds of the feet inflicted by the one foot treading upon the other can be prevented by adding a calkin on the outer heel of the shoe, which consists in the extremity of the shoe being bent, elevating the outer heel considerably above the ground, and thus the ligaments of the joints are subjected to an unequal

strain, and especially those of the hock, which increases the tendency to spavin.

It is this which induces in the first instance inflammation of the cartilaginous union of the shank-bone, and this cartilage is absorbed, and a secretion of bony substance deposited in its stead; consequently the elastic action between them is terminated, and the splint inside the hind leg formed, and has the appearance of a tumour, when the head of the splint-bone is united with the shank, and always in front of that junction, as exhibited in plate 7, fig. 3, *c*.

Lameness universally accompanies spavin, but when the periosteum or membrane of the bone has been stretched, and taken the form of the bony enlargement, then the pain subsides, and with it the lameness. This, however, depends upon the size of the spavin, and whether it interferes with the motion of the joint. Many instances occur of horses with large spavins, and yet they are not much afflicted with lameness; sometimes having merely a stiffness of the joint, which is not apparent after the animal has had a little exercise. And, on the contrary, there are instances in which the bony deposit is very small, and yet the horse is very lame, so much so as to render him comparatively useless. It must therefore be evident that we ought carefully to examine horses with spavin before they have had exercise, and as soon as they have left the stable.

Sometimes spavin continues to enlarge considerably, and spreads over the lower wedge-bones, (plate 7, fig. 8, *e*.) in consequence of these being nearest the original seat of the enlargement. These bones are capable of a small degree of motion, and participate in every action of the joint, but their chief office is to prevent concussion. The principal motion of the joint is in the tibia, *b*, and the astragalus, *c*, and consequently stiffness more than lameness may

accompany spavin, even when the small bones of the joint are affected. From which also it will be seen that there is a manifest advantage in each of these bones being provided with a separate ligament and membrane, and thus, as it were, constituting so many separate joints; so that any of them may sustain injury, without its being communicated to the rest. It is not uncommon for the bony deposit continuing to enlarge and embracing the second series of bones, enveloping the larger wedge-bones, *d*, and extending to the cube-bones on the other side; and even then the lameness may not be so great as to prove very injurious, for this reason, that the motion of these two joints, or rather parts of the joint, is small; but when it reaches to the union of the tibia, *b*, and the astragalus, *c*; when the joint in which the principal motion of the joint is affected, then the lameness is of a very serious kind, and the horse may be considered as no longer fit for use.

Although spavin unfits horses for active employment, yet for farm purposes they need not be rejected, especially by those who possess limited farms; for slow draught and other agricultural purposes they will be found quite useful, and from this sort of work, in which quick motion is not required, the horse may improve, and even the bony matter may be absorbed to a considerable extent.

One strong reason why spavined horses do not improve, is that they seldom lie down, as they are conscious that they will suffer considerable pain in the act of rising again; so that the continual pressure and weight of the body upon the limb, keeps alive the exciting cause.

There is sometimes an enlargement of the heads of the bones of the leg, which may be mistaken for spavin.

REMEDIES.—Spavin can only be successfully treated, if at all, by blisters frequently repeated, which may induce an

absorption of the bony deposit, or at least a diminution of the ligamentary inflammation. When this fails, then recourse may be had to the cautery, and if burning proves ineffectual, no other known means is likely to succeed.

BOG OR BLOOD-SPAVIN.

Bog-spavin is a puffy elastic tumour on the inside of the hock, (plate 7, fig. 6, *c*.) It is in fact an enlarged and inflamed wind-gall of the part situated under the large subcutaneous vein which runs up the inside of the leg, and which being compressed by this enlargement, prevents the blood from flowing freely through it. This interruption of the circulation not only increases the size of the tumour, but also occasions a general torpor and stagnation of the blood, and, consequently, swelling of the limb in a slight degree, which presents an obstacle to its free action, and produces a very bad and incurable lameness. Even when lameness is removed, it has a strong tendency to return whenever the animal is subjected to severe labour; and therefore a horse having some time been afflicted with it must be considered as decidedly unsound; so that the safest plan is to get rid of a horse under those circumstances; and he may be worked in a cart or plough without the danger of a return of the malady.

The seat of this disease is deep, and consequently there is much difficulty in operating upon it. The simplest, and probably the best application is uniform pressure, which may induce absorption of the fluid contained in the enlarged mucus-bag. But this joint being exposed to almost constant motion, there is much difficulty in keeping the pressure uniform, and if it should happen to press upon the vein, it will only increase the inflammation.

REMEDIES.—This, like bone-spavin, admits but of a limited

degree of treatment. Repeated blisters are the most likely to afford relief. These, by exciting a considerable degree of inflammation on the skin, may energize the deeper-seated absorbents, and enable them to take up the effusion of fluid in the enlarged and inflamed bag. But, in the majority of cases, all means which have hitherto been tried have proved abortive.

OF SWELLED LEGS GENERALLY.

SWELLING OF THE CELLULAR SUBSTANCE.

Both the fore and hind legs of horses are liable to considerable swelling, but the latter are most subject to be thus affected. Frequently, when a horse seems to be affected with no other disease, the hind legs will suddenly swell to a very great extent from the hock to the fetlock, and in some instances even from the stifle downwards. This is accompanied by heat and extreme tenderness of the skin, inducing lameness of a peculiar character. A quickened and hard pulse are usual concomitants of this seizure, with a considerable degree of fever. This complaint is acute inflammation of the cellular substance of the limbs, being sudden in its attack, very violent in its degree, is consequently attended with the secretion of a quantity of fluid on the cellular tissue. Young horses, and those which are over-fed, with little exercise, are most liable to be thus attacked, and without having had previous inflammation.

REMEDIES.—If accompanied by fever, moderate bleeding will afford relief; after which the following diuretic should be given :—

Turpentine	.	.	.	$\frac{1}{2}$ ounce,
Ginger	.	.	.	$\frac{1}{2}$ drachm,
Lintseed meal	.	.	.	$\frac{1}{2}$ ounce ;

made into a ball with common syrup.

Two hours afterwards give the following purgative, in the form of a ball :—

Barbadoes aloes	.	.	5	drachms,
Castile soap	.	.	1½	drachm,
Oil of caraways	.	.	8	drops.

Also use fomentations, and in most instances the swelling will subside as rapidly as it appeared.

SWELLING FROM INACTIVITY.

The most troublesome, as well as the most frequent swelling in the limbs, is that caused by inactivity, from high feeding and want of due exercise. One kind is accompanied by actual or comparative debility, or loss of power in the part affected. Those horses which are over-fed, without exercise, are liable to swellings in the limbs from the arterial capillary vessels having sent forth an over-portion of fluid to the extremities, and in consequence of the want of muscular exertion and the perspiration naturally connected with it; and the fluids having accumulated in the extremities, in consequence of the vessels not having sufficient power to return them. The heart is thus acting upon an additional quantity of fluid; while, by the want of exercise, the limbs are deprived of that power by which the fluids are returned.

REMEDIES.—The above physic and diuretic should be administered. These will lessen the quantity of fluid; also exercise the horse freely, which will increase the perspiration externally, and diminish it internally, and the veins and absorbents will attain more activity, so that the complaint will gradually subside, and the limbs resume their wonted appearance.

SWELLINGS AFTER GRASS.

It is a common occurrence for horses just taken in from

grass to be seized with swelling in the legs. This is occasioned by the difference of food, owing to its containing a greater proportion of nutriment, which naturally increases the quantity of the blood, and the want of that exercise which is necessary to carry it off by the skin. It will therefore be quite apparent that exercise and a little opening medicine will effect a cure.

Horses may also have swelled legs from general debility. The proper quantity or quality of food may induce this, or it may proceed from disease that has reduced the strength of the animal system. The limbs, being the most remote from the centre of circulation, first exhibit loss of power; and this is manifested by swelling, in consequence of the accumulation of fluids in them.

The cure in this case would be to give such diet and tonic medicines as would tend to invigorate the system, as well as to administer mild diuretics.

Horses are liable to swellings in the limbs in the spring and fall of the year. This can be accounted for by the principal activity of the circulation being employed in preparing a fresh covering of hair at those periods, so that the vital influence in the extremities is somewhat diminished, and the same cause as above explained produces swellings in the legs. Administer diuretics to diminish the quantity of the circulating fluid, and give cordials to strengthen the system.

Swelling of the legs is also common to horses which are used for hunting and pleasure only. This, it will be seen, arises from irregularity in their habits, one day having a more than sufficient exercise, and probably standing for days or weeks in a stable, and only walked out or trotted for a short distance. In such cases the limbs should be well

rubbed down every day, both morning and evening, so as to stimulate the vessels to activity. Pressure by means of bandages will also be found to have a powerful tendency to promote the circulation. It is too much the practice of grooms to give diuretics in swellings of the limbs, as these by being frequently repeated are sure to weaken the urinary organs and produce an incurable debility.

GREASE.

This is a disease of the skin of the heel, sometimes in the fore feet, but most commonly in the hind ones. The disease is too frequently the effect of washing the limbs with cold water while they are over-heated from exercise, and allowing them to dry of their own accord ; the consequent reaction after the application of cold being very great, produces inflammation. The vessels becoming gorged, nature seeks to relieve them by sending forth a discharge of ichorous matter from the parts which are so violently inflamed. Another cause is taking a horse into a warm stable in winter, when the legs have been chilled by excessive cold from standing.

Grease is not contagious, yet it has been known to affect all the horses of a stable at the same time, after one has been seized with the complaint. This can only be accounted for by bad stable management. The skin of the heel is considerably different in its texture from that of other parts of the legs. The fetlock is subjected to a greater degree of motion and friction than any other joint, and it is provided with a soft unctuous matter to keep it from chapping or excoriation, which can be easily felt to be greasy to the touch. When inflammation ensues, this greasy exudation stops, and the heel exhibits a red, dry, and mealy appearance ; and in consequence of the continual motion of this

joint, cracks soon make their appearance ; these increasing considerably, present an entire mass of sores, which ulcerate very much and assume a fungus-like appearance.

It is easy to account for the tendency of the heels to violent inflammatory attacks, which arises from their being so remote from the centre of the circulation, and also their constant exposure to extreme variations of temperature. In the first place, when standing in the stable the feet are subjected to a great degree of heat, from being at all times surrounded with straw, and then when the door is opened his heels, in many instances, being close to the door, are exposed to any cold draught which may rush in ; and then he may be taken from the stable to the open air and walked through soft and cold mud, after being over-heated, and thereby chilled. It is easy then to see that they are constantly liable to inflammatory attacks by being thus exposed to sudden transitions from one temperature to another, and hence the difficulty of subduing those attacks of inflammation to which the horse is liable.

Farmers' and carriers' horses, and indeed those in general which are worked in carts, are not so liable to grease as riding and carriage-horses, being less exposed to those extreme transitions from heat to cold, or *vice versâ*. And the hair, which is usually allowed to grow plentifully at the heels, is a great protection against sudden changes.

REMEDIES.—The first thing to be done is to wash the heel well with soap and warm water, and remove as much of the white scurf as possible. When it has become perfectly dry, which should be accomplished by rubbing, then the following ointment should be applied until the parts are healed :—

Lard	.	.	.	.	1 ounce,
Sugar of lead, well pounded					1 drachm.

In cases where cracks appear, the treatment will greatly depend upon their extent and depth : when they are small, the following lotion will be found beneficial :—

Blue vitriol (or sulphate of copper) 2 drachms,
Water 1 pint ;

or four drachms of alum may be substituted for the vitriol, with the same quantity of water. This will speedily dry them up and close them. When the cracks are large and deep, and discharge an ichorous matter, accompanied with considerable lameness, a poultice of lintseed-meal will be indispensable ; but when the discharge is thin and accompanied by a fetid smell, it will be necessary to mix an ounce of finely powdered charcoal with the lintseed-meal, as it is a powerful antiseptic ; or a carrot poultice may be used in its stead : the carrots to be boiled and mashed. The poultices to be applied until the inflammation has abated, and a thicker and more healthy matter flows from the cracks. After this apply the following ointment :—

Resin 1 ounce,
Calamine powder 1 ounce,
Lard 3 ounces.

Let the resin and lard be melted together, and when sufficiently incorporated, allow the mixture to stand until nearly cold, then add the calamine, and stir them well together. This precaution is necessary, as the calamine would fall to the bottom if the mixture were thin. During the time of the above application, the cracks should be frequently washed with the solution, which will stimulate them to heal more speedily. Administer the following diuretic :—

Turpentine $\frac{1}{2}$ ounce,
Ginger $\frac{1}{2}$ ounce,
Purified nitre $\frac{1}{4}$ ounce,
Lintseed-meal $\frac{3}{4}$ ounce.

Three hours afterwards let the following laxative be given :—

Barbadoes aloes	.	.	4 drachms,
Castile soap	.	.	$\frac{1}{2}$ drachm,
Oil of caraways	.	.	10 drops.

When the cracks have been healed up, the legs will sometimes continue swelled. In this case a bandage will be found of much advantage. But nothing is better than turning the animal out to grass, if the season of the year is favourable. Blistering in this case should be had recourse to ; but burning may be resorted to with benefit if the skin is not broken by it, as this might be attended with bad consequences. Frequently the cracks spread over the whole heel and fetlock, or up the limb, as is sometimes the case ; and while the leg is considerably swollen, accompanied by a discharge of a thin watery matter from the cracks, and makes its appearance also in other parts of the limb, accompanied by great heat, so much so that the heels smoke, the skin being so hot that the watery fluid partly evaporates as it oozes from the cracks or through the skin.

In the above state it would be attended with very bad consequences to stop the discharge suddenly. The first thing to be attended to is to allay the inflammation, and nothing is better calculated to do so than poultices, as already recommended, particularly those of carrots. When the heat, tenderness, and stiffness have abated, then a stringent, already recommended, should be used ; but that made of alum, or a strong decoction of bark are the best. Indeed it would be preferable to use these lotions alternately, but not a mixture of the two. The ointment above named should be used for dressing the cracks ; and as soon as the horse can bear the pressure without pain, a flannel bandage should

be applied, extending from the coronet to some inches above the swelling.

From this period mild doses of medicine and diuretics should be given, accompanied by a third part of cordial mixture, which is composed of the following ingredients :—

Caraway powder	.	.	8 ounces,
Bruised resins	.	.	8 ounces,
Ginger	.	.	4 ounces,
Palm-oil	.	.	4 ounces ;

to be well beaten into a pulp.

If the horse is of a full habit of body, physic should always be given before diuretics, and in some instances it will be prudent to abstain entirely from giving the latter ; but in cases where the animal is much debilitated, diuretics with the above pulp will be preferable. It will also be necessary to attend carefully to the feeding of horses at this time. Green meat will be found the best, and carrots are still better, and a very moderate quantity of corn, so that the tendency to fever may be kept down. The next essential is proper exercise, and care must be taken not to overdo it ; and when the animal has been walked for some days, he may be afterwards exercised at a gentle trot.

There is a much worse kind of grease than that which we have just described and prescribed for, although it is not so common. In this species the ulceration spreads over the skin of the heel and the entire fetlock, and a highly sensitive fungus protrudes from both, mixed with scales : it is irritable in the extreme, and bleeds on the slightest touch. In a short time this fungus assumes a covering of a horny texture, projecting in the form of knobs and in congregated bunches, which, from their peculiar similarity to grapes, have acquired that name. From the

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entire surface of this callous substance issues a discharge of a peculiar fetid matter. In this complaint the horse suffers great pain and uneasiness, and quickly loses flesh. It would not be safe for any one but a veterinary surgeon to attempt a cure for this loathsome complaint.

CHAPTER VII.

DISEASES OF THE FOOT.

THE diseases of the feet in horses are more numerous, and of a more complex nature than the inexperienced can have any idea of. The structure of the foot is very complicated, and having to sustain the weight of so heavy an animal, besides being exposed to the chances of many injuries, a knowledge of these is of paramount importance, both as regards the safety of the proprietor and the intrinsic value of the animal. When, therefore, we arrive at the anatomical description of the horse, we shall dwell at some length upon the structure of the foot as well as of the pastern.

ACUTE FOUNDER.

Inflammation of the foot has been denominated "acute founder." It is the cause of many other diseases, and is more or less connected with them all.

Inflammation of the sensible lamellæ, or fleshy plates on the front and sides of the coffin-bone, is the cause of acute founder. These lamellæ are thickly intersected with blood-vessels, like every other vascular part; and, consequently, from their exposure to violent and long-continued action, they are elongated and strained, more especially when the

hoofs have been subjected to a day's journey on a hard road. It is easy to imagine that if, after the feet have been thus heated, they should be washed and not immediately and thoroughly dried, or the animal allowed to stand, with his feet exposed to a cold draught of any kind, that inflammation is likely to ensue from this sudden change of temperature. This observation is equally applicable to the change from cold to heat.

SYMPTOMS.—Inflammation in the feet is manifested by restlessness and fidgety action of the fore legs, frequently shifting the weight of resting from the one to the other. But there is no appearance of pawing, or of elevating the hind legs towards the belly, as in colic and other intestinal complaints. The pulse will rise to a pretty rapid state, the flanks will heave, and the inside of the nostrils will become very red, his countenance will exhibit an anxious expression, and that he is suffering pain will be indicated by moaning. He will then scrutinize his litter, as if indicating a wish to lie down, but will not do so immediately, from an apparent fear of drawing his limbs together. He still continues to shift the pressure of his weight from one foot to the other, until impelled by pain and fatigue he at length lies down. There is a marked distinction in respect to his lying down between this and inflammation of the lungs, for in the latter complaint the horse never lies down until he drops under the influence of complete exhaustion. When a horse which is affected with inflammation of the feet lies down, he invariably rests quietly, because the heat is so much relieved from the removal of the weight of his body; whereas in colic and inflammation of the bowels, he kicks and rolls about violently, and his constantly looking at the part affected as clearly shows the seat of the disease. A little attention to these will soon point out to the inexperienced where the malady exists.

After these symptoms have been manifested, the first thing to be done is to examine the foot, when it will be found very hot. Tap gently on the foot with a hammer, which will cause the artery at the pastern to throb violently, and the horse will express pain at the same time. The effects of inflammation in the foot are very rapid, and but a short time will elapse before the horse will be quite unable to get up, unless some means are adopted to check the progress of the complaint. Even when horses have been forced up while thus afflicted, they have been known to fall down immediately, from the intensity of pain which they suffered by resting on their feet.

REMEDIES.—The treatment of this should be like that of all other inflammatory complaints. Bleeding must therefore be immediately resorted to, and that ought to be copious. If the disease is in the fore feet, three quarts of blood must be taken from the toe of each foot, at the position pointed out (plate 6, fig. 10, *w*,) and in the manner described at page 118. After this large poultices of lintseed-meal should be applied, so as to cover the entire foot and pastern, and these ought to be frequently replaced by fresh ones. The shoe should be removed, and the sole pared as thin as possible, and the crust of the hoof well rasped down, more especially in the quarters. This operation should be done as gently as possible, as in founder the pain experienced from the excessive inflammation is very great. This having been accomplished, recourse must be had to very mild purgatives. The following may be given in the form of a ball:—

Barbadoes aloes	.	.	1 ounce,
Calomel	.	.	2 drachms,
Jalap	.	.	$\frac{1}{2}$ drachm.

Inflammation of the foot is always accompanied by intense fever, and there is a danger of the inflammation

shifting from the feet to the bowels or lungs ; as it is no uncommon occurrence for horses labouring under inflammation of the feet to have that suddenly transferred to the lungs, or *vice versâ*. In such a case it might, and indeed often proves fatal to the animal. It is therefore, probably, safer to have recourse to sedative medicines at first. The following are the proportions to be given once a day, three or four times :—

Digitalis	.	.	.	1	drachm,
Nitre	.	.	.	2	drachms,
Emetic tartar	.	.	.	1½	drachm.

If on the next day after bleeding no evident abatement of the complaint is observable, then it will be necessary to have recourse to bleeding again, and two quarts from each foot may be taken ; and in cases which resist this second bleeding, a third time will be necessary, but it should not exceed a quart from each foot. To cool the feet, cloths wet with water in which pounded nitre has been dissolved immediately before used, should be frequently applied. This solution should be in the proportion of one ounce of nitre to a pound of water. About the third day a large blister will be found useful ; it must embrace the whole coronet and pastern. Previous to this, however, a cradle must be put on the horse's neck, and the feet must be covered after the removal of the blister, to prevent them from being blemished, which they are liable to be if exposed to the air. If at a favourable season of the year, the animal should be fed upon green meat or upon mashes, but which should always be limited, as nothing is so likely to keep up inflammation as a full stomach.

It should on no account be attempted to force a horse to rise, as the animal will not lie longer than is necessary for his recovery, and every symptom of lameness should be gone

before walking exercise is attempted. A month or two's run at grass will be attended with much advantage after founder.

No disease is more to be dreaded than violent inflammation of the foot, as, even with the utmost attention to remedy the complaint, very bad consequences result from it. One of these of frequent occurrence is loss of the hoof. The first symptom of this is the appearance of a small separation between the coronet and the hoof. Great attention to this is necessary, as the horn thus separated will never reunite with the parts beneath, but the separation will continue to extend downwards, until entire disunion is effected and the hoof is ultimately lost. This is a most serious affair; for although a new hoof will be formed, it will be not only smaller in size, but also thinner and weaker than the first, and liable to be injured by any kind of hard labour or rough roads.

In the event of no smith being at hand when it is ascertained that a horse has been seized with inflammation of the foot, and if the proprietor or his groom are not acquainted with the mode of paring down the hoof, then it will be safer to bleed from the vein running up the inside of the leg, as it is better to take blood from the nearest contiguous part to that which is affected, than not to do it at all at an early stage of the complaint. Pressure should be applied above the part to be opened, thus differing from blood-letting from the neck, which is always made below it.

CHRONIC FOUNDER.

Chronic founder is merely a conventional term, adopted by farriers to express those changes which take place in the foot of the horse in disease brought on by bad shoeing or mismanagement in some way or other. In fact, it is a word

too frequently used as a cloak by ignorant pretenders. Much attention has been devoted to diseases of the foot by many talented veterinary surgeons, but still these complaints are in a state of obscurity. Some feet are diseased to lameness without exhibiting any external signs of its cause, and many others arise from contraction also, without any other mark of disease. I shall therefore dwell at some length on this important subject.

CONTRACTION.

To enable persons to judge of the perfect and healthy state of the foot of a horse, they should examine those feet of young horses in the natural condition which have not been shod or worked in any way. We have given a representation of the sole of a sound foot, (plate 6, fig. 12.) It will be seen that it is very nearly circular, and is somewhat widest towards the quarters; the inner one is a very little wider than the outer. This form, however, seldom continues long; for the foot increases in length and gradually becomes narrow in the quarters, more especially at the heel, when the frog becomes contracted. The entire foot assumes a greater concavity, and the heels become higher, which induces lameness, or a circumscribed action follows. To those unacquainted with the different parts of the sole, we refer to the above figure for their form. The crust is represented at *a a*; the sole, *b*; the bars, *c c*; the frog, *d d*.

Contraction may exist without inducing lameness; nor does shoeing always promote this narrowing of the foot, although it is in many instances the source of contraction when unskilfully performed. The mismanagement of the stable is the source from whence this, as well as many other serious maladies, have their origin.

In examining a contracted hoof, it is difficult to deter-

mine whether or not it is of such a nature as to render the horse unserviceable, as this can only be ascertained by his action and manner of placing his feet on the ground while in progressive motion. When contraction first commences, it is for the most part accompanied by a slight degree of lameness; and when it is making rapid advancement, it is always attended with lameness, but it does not invariably exist when the process of *wiring in* is slow, or is of long standing.

CAUSES.—If the owners of studs would look carefully into their general stable management, their horses would be afflicted with fewer diseases, and many of them would be prevented or ameliorated by a little personal attention to the stable. One of the chief causes of contraction in the hoofs is *neglect of paring*. The crust of the hoof, like all other horny parts of the animal system, is continually growing, and consequently lengthens, while the sole becomes thicker. As Nature never intended that horses should be shod, this is a beautiful provision for the wear and tear of the hoofs. But when the hoof is protected by a shoe, it is prevented from being worn down by the friction of coming in contact with the ground; the consequence is, that the hoof gets high in front, and the sole becomes thick as the expansion and descent of the sole and heel are interrupted, and thus contraction is induced. To obviate this the smith ought carefully to pare the sole and lower the heel each time the horse is shod. No doubt the thinning of the sole is attended with considerable labour, and without this is attended to, lowering of the heels cannot be accomplished, so that in avoiding the first both are neglected. In many instances, however, a prejudice is entertained by owners of horses that cutting away the hoof is injurious. Certainly, mischief may be done by overdoing cutting, and by carrying

it to such an extent as to destroy the bars, and thus leaving the frog elevated from the ground, but such extremes are the result of ignorance; for to allow the sole to thicken must limit the expansive principle of the hoof, by rendering it unelastic, and consequently unyielding, which cannot fail to militate against the comfort of the horse and impair his usefulness. From this it is obvious that it would be decided economy to pay the smith the value of the increased labour, and it should be accomplished under the inspection of a careful groom, or the owner himself.

It is a grand mistake for persons allowing the shoes of horses to remain on longer than three weeks or a month. Whether the shoes are worn or not, they should be taken off and the soles and heels thinned and pared. Without this precaution the feet must become malformed. I have known instances where riding-horses have been so seldom ridden or exercised, that their shoes have lasted three and even four months, and were not removed during this time, proceeding in some cases from the parsimony of the owners, and in others from their ignorance of the evil effects which would result therefrom. In some instances the shoes were made thicker than was necessary, consequently the animal subjected to carrying superfluous weight, besides being tightly fastened on and provided with an extra number of nails, and these too at the quarters. All of which increase the tendency to thickening. It is perfectly clear that without due attention to the above points, in proportion to the degree of neglect, so will the evil consequences increase, and the hoof must contract and close up the foot round the coronet. It is a notorious fact that low-heeled horses are seldom liable to contraction of the hoof.

Contraction is also caused by want of natural moisture. It will be seen that horses at grass are seldom or never

afflicted with this evil, in consequence of the hoofs being kept cool and moist by the grass and occasional showers, by which their natural elastic condition is preserved, and consequently its expansive energy. Horses kept in a very dry and heated stable are certain to be liable to dryness of the hoofs, and hence that shrinking of the horny substance. It must therefore be sufficiently evident that some artificial means must be adopted to counteract this. Stopping the feet is the most obvious remedy, and ought to be had recourse to every night. A compound of cow-dung and a small quantity of clay is most commonly resorted to ; but a better one is a piece of thick patent felt, cut the shape of the sole, with a padding above. This should be soaked in water and applied to the foot. A common stopping was a mixture of tar and grease, but this has the tendency of increasing the evil which it is intended to remedy, causing brittleness and dryness in the hoof.

It has been argued by many that the litter of the stable causes dryness of the hoofs, in consequence of the feet being in a great degree covered by it ; but I am disposed to think that litter which has been subjected to the pressure of the horse while lying down during the night, or even of his feet, cannot extend high on the hoofs during the day. Many resort to removing the litter entirely in the day-time. This, however, is quite unnecessary, and even objectionable, as it must be less comfortable to the animal ; and by the horse beating on the hard stones, as they are frequently in the habit of doing, the growth of corns is apt to be induced. As we have before noticed, while treating of grease, that keeping the heels of the horse embedded in straw and afterwards subjecting them to the cold of an open door may produce grease ; but we have never given credit to the injury we are now treating of being caused by the same means.

That moisture and keeping the feet cool are the most certain means of preventing contraction, we need only refer to the farmer's horses, which are so seldom, comparatively speaking, liable to contraction. It is a very common practice for farmers to turn out their animals after their daily labour. Being thus daily exposed to moisture, they are so much the less liable to hardness and contraction of the hoofs.

Nothing can be more injudicious than to remove the bars, as they are a grand protection against contraction, their use being principally to prevent *wiring in*, so that cutting them away is certain to facilitate and greatly increase the contraction after it has begun ; but we must not have it supposed that the removal of the bars of themselves would produce this tendency.

It has been said that thrushes are often the cause of contraction, but they are more frequently, if not altogether, the consequence rather than the cause.

Many persons are disposed to have an undue objection to contraction, and at once reject a horse that exhibits the slightest degree of *wiring in* of the quarters. There can be little doubt but this is a malformation of the hoof ; but one thing is certain, that its growth is very slow, the altered form extremely gradual, and the parts are progressively accommodated to the change of form. As the hoof contracts, the under parts, and especially the coffin-bone and heels of the coffin-bone, diminish in size. However, this may be considered a mere change of form rather than of capacity ; for as the foot narrows, it acquires additional length, in consequence of the elongation of the coffin-bone, and accommodates itself as completely to the coffin or box as in its original condition ; and its small leaf-like margins are as firmly connected with the crust as before the change, which, in a great measure, compensates for its limited

breadth. So that horses may have their feet considerably contracted without being at all unsound. From this, however, we would not have the purchaser hastily to jump at the conclusion that a horse with feet such as we have just described is positively sound; on the contrary, we would recommend him carefully to examine such a horse scrupulously, but if he finds his action good, and his other points as he would wish them, then we would not recommend him to reject the animal.

The species of contraction which occasions permanent lameness, generally proceeds from another cause, and is not only sudden in its attack, but also extreme in its nature. This is inflammation of the small plates which cover the coffin-bone. This inflammation is not so violent as in acute founder, but it speedily assumes a serious character, and terminates in distressing results; and thus we find that it proceeds from causes which were concealed from our view, and too frequently unsuspected.

We have already said that contraction is rare in agricultural horses, but it is of frequent occurrence in the stud of a gentleman or coach-proprietor. In both these latter situations much more attention is paid to shoeing, not only in the construction, but also to the frequency of change. This would appear an anomaly, and contrary to the theory which we have advocated. However, this may be accounted for by the circumstance that blood-horses are extremely liable to contraction, induced no doubt by the smallness of their feet and the original narrowness of their heels. In horses equally high bred it has been observed that proneness to contraction depends much upon colour, as the dark chestnut horses are, above all others, liable to be thus affected; while in the broad, flat-hoofed cart-horse, contraction seldom occurs.

Another source of contraction proceeds from the manner in which the animal is treated. Many are over-fed and not sufficiently exercised. Some are permitted to stand in the stable for days together without being taken out. Such horses must consequently be more liable to inflammatory attacks. The laminae or little plates of the coffin-bone are extremely sensible ; they are scarcely lengthened, when, from want of exercise, they begin to diminish. It is natural, therefore, to suppose that if the horse is suddenly and violently exercised, either upon the road or in the field, these exquisitely sensible plates should, from concussion, become rapidly elongated and the whole foot heated, and that inflammation should follow. The various parts of the foot then undergo an alteration of structure ; and hence a partial separation between the internal and external parts of the foot, limited expansion of the quarters, and a contraction and falling in of the crust takes place.

SYMPTOMS.—Horses which are lame from rapid or severe contraction always stand in the stable with one foot before the other, the lame foot being placed forward ; but if both feet are affected, then he will change them alternately. When a horse with this complaint is taken out of the stable, it will be detected by the peculiar shortness and quickness of his step, and he will place his feet very gently upon the ground, and if trotted will hardly clear the surface as he moves along ; so that he is apt to come down by any uneven place on the road, and will be constantly stumbling even with the smallest irregularity of surface.

Contraction is manifested by the fore feet being considerably narrowed across the quarters, and also towards the heels. In some few instances the entire foot will exhibit a contracted appearance, as if it were shrunk ; but in most cases while the heel is narrowed the front will be elongated

Both heels are sometimes contracted, at other times the inner one only. While both are affected, the inner one is generally *wired in*, in most instances, but chiefly at the coronet, at other times near to the sole of the foot; but most frequently the contracted part is situated intermediately between the coronet and sole. But in whatever portion of the foot the contraction exists, it will be indicated by that part being much warmer than the rest, and by an unusual degree of concavity in the sole · sometimes to a very great extent.

REMEDIES.—Many have been the inventions to prevent and retard the progress of contraction; few, however, of these have had more than an ephemeral existence. The medical remedies of this complaint should not be entrusted to any but a regular veterinary surgeon; because the chief thing to be done is to remove the inflammation which may exist, and this is best effected by local bleeding and doses of physic. The sole should be pared as much as it will bear; the quarters should then be deeply rasped, taking care not to penetrate so deep as the coronary ring, (plate 6, fig. 9, c.) The toe ought next to be rasped, and it should likewise be scored. Wet clay ought to be so placed in the stall that the horse will stand in it all day, and at night a plentiful supply of wet cloths should be tied round the foot; or he may be put out to wet pasturage and his feet frequently pared and rasped, as above recommended. It will require a run of five or six months before the horn will have grown fully down. He may then be shod, but without nails in the inner side of the shoe. The foot will have enlarged considerably. He may now be gently worked. It will be found, however, that where expansion has taken place forward on the quarters, that the crust will not have its natural adhesion with the elongated and narrowed heels

of the coffin-bone, not being properly in contact. A very trivial cause will induce the foot to contract as much as it was before. It is therefore the best policy to allow a contraction to remain untouched, unless the action of the horse is very much impaired; as it will be seen that a great length of time and trouble are required to effect any thing like a change on the hoof; and, after all, it is very uncertain both in its results and also in its proving an effectual cure. The contracted heel can very rarely be expanded, for the reason that the elongated and narrowed coffin-bone can never be made to resume its former shape, nor can that portion of the frog be restored which has been absorbed.

Where old contractions exist, which are accompanied with a cautious step, *neurotomy*, or cutting out a small portion of the nerve, may be had recourse to with much advantage. The mode in which this is accomplished will be found in the chapter treating of operations. By means of this, lameness has been completely removed. The foot being again allowed to rest fully upon the ground, the inner side of the shoe being left free from nails, a portion of the contraction is likely to be removed, from the due pressure of the sole on the ground expanding the hoof.

SAND-CRACK.

This is a downward crack, or division of the hoof, as represented on plate 6, fig. 8, *a*. It may, however, occur either in the fore or hind feet. In the fore feet they are usually found in the inner quarter, although they sometimes exist in the outer quarter. The reason why the quarters are most liable to this is, that the chief stress of the foot is where it expands, and the inner quarter is weaker than the outer. Sand-crack almost always occurs in the front of

the hoof in the hind feet, occasioned by the pressure applied by the toe in progressive motion, especially when the animal is dragging a heavy load behind him, and more particularly on an ascent.

Hoofs that crack in this manner are brittle in the crust, which is an extremely bad defect, and is caused by a want of that nutriment necessary to keep the crust supple. It also proceeds from disease in the foot. It may besides occur from a false step or over-exertion.

Sometimes the crack is only superficial, and does not extend through the hoof, in which case it occasions no lameness. It will, however, require attention, as, if neglected, it may reach the quick, and occasion much trouble.

REMEDIES.—When sand-crack is occasioned by brittleness of the hoof, let the following composition be rubbed into the crust twice a day until it becomes pliable:—

Oil of tar 2 ounces,

Common fish-oil 4 ounces.

To assist in softening the hoof while the above ointment is used, cow-dung or felt should be applied to stop the foot, as recommended in contraction of the hoof, page 157. In a superficial crack it should be pared and rasped entirely out; and if it has been of considerable depth, it ought to be strengthened by a coating of pitch, applied so thick as to replace all that has been rasped off, and formed so as to represent the natural shape of the foot. Indeed rasping ought to be had recourse to with every crack, so as to ascertain its depth. Should it be found to penetrate through the crust without occasioning lameness, and is situated low down on the foot, recourse must be had to a red-hot firing iron, which should be drawn across the hoof, both above and below the crack, so as to prevent it from extending. The edges ought thereafter to be thinned, to prevent any

pressure which might cause pain to the tender parts below ; and it must be bound up, taking care to avoid pressure immediately beneath the crack. Neither must the shoe be allowed to press upon the part below.

Should lameness proceed from the crack having penetrated through the hoof, the cure is much more difficult. The first thing to be done is to examine the parts, to ascertain whether any sand or dirt has got in and has reached the quick below, and the crack thoroughly cleaned out. If proud-flesh is found in it, an application of chloride of antimony must be used to destroy it, and the edges of the crack must be considerably thinned. Some veterinary surgeons have used the cautery ; but this has a tendency to thicken the edges of the horn and render it rough, which is liable to irritate the tender portions below. After the fungus has been destroyed, it will be necessary to apply the iron above and below, as recommended in a superficial crack. A pledget of tow should be put into the crack, and another over it, and then firmly tied down, and not examined until the third or fourth day after. If the proud-flesh has not been eaten away, it will be necessary to apply the caustic again. On the other hand, if the crack is quite dry and exhibits a hard horny crust, the pitch-plaster should be immediately applied. Bees'-wax is considered preferable by some, and the crack carefully filled with it. The wax must be applied warm ; and to fill the crack properly, it is necessary to draw the heated cautery slightly over it. This gentle pressure will contribute to the healthy granulation of fresh horn, and at the same time prevent the access of sand or dirt, and also cold or wet, or the influence of the atmosphere from reaching the tender parts of the foot.

The worst case of crack is caused by tread, which divides

the coronet ; and where this is imperfect the horn or crust will grow down divided, because the growth of horn proceeds from the coronary ligament. The mode of cure which has been most successful in this crack, has been to draw the heated cautery over the division of the coronet. This will be followed with some degree of inflammation ; a scab will form on the part, which in a few days will fall off, when it will be found that no traces of the division will be visible, and fresh and sound horn will speedily grow downwards. When division of the horn at the coronet takes place, it requires five or six months to effect a cure. When the horn has grown downwards for an inch, the animal may be turned out, taking care that the part is well defended by a clambered pitch-plaster, which should be replaced by a new one as often as it separates from the hoof. At the same time a clambered shoe should be applied, but it must not press upon the hoof immediately under the crack. Every three weeks the shoe should be taken off and the sole carefully pared down. It sometimes happens that bulbous projections are formed on the new horn. These should be carefully pared off. During the time the horse is subjected to surgical treatment for this complaint, he must have perfect rest, otherwise the cure will undoubtedly be protracted.

In purchasing a horse, it is absolutely necessary to examine with care the inner quarter of the feet, as it is very common for low, unprincipled dealers to cover over sand-cracks so neatly with pitch, and afterwards along the whole hoof, that it is so completely concealed, as not to be observable except by a narrow inspection.

THE NAVICULAR-JOINT DISEASE.

Behind and beneath the lower pastern-bone, and behind

and above the heel of the coffin-bone, is placed a small bone, called the navicular bone. (See plate 6, fig. 10, *e*.) The use of this bone is to support and strengthen the union between the lower pastern and the coffin-bone, and to assist the flexor tendon in its action as it passes over it, in order to be inserted into the bottom of the coffin-bone, and forms a sort of joint with that tendon. The navicular bone is subjected to much pressure, as is also this tendon; and besides, there is much play between them in the bending and extension of the pasterns.

CAUSE.—Like many other complaints of the horse, this is often induced by sudden and violent exercise after the animal has been allowed to stand in the stable inactive. The parts not being for some time adapted to overstrained action, there may be too much play between the bone and the tendon, and by concussion of the parts the periosteum or delicate membrane which covers the bones may be bruised; or the cartilage of the bone may be inflamed, and thus produce destruction of it, and cause a lameness of the most painful description. From the navicular bone being so obscurely situated, it is difficult to ascertain by inspection when it is diseased. And this has puzzled many to find out the cause of lameness emanating from it, and has too often been attributed to the shoulder. Indeed the action of the horse with this lameness has all the appearance of being seated in the shoulder. Of late years the attention of veterinary colleges has been particularly directed to this point, and it has been found in numerous cases of dissection that this is the seat of this lameness, which has deceived and puzzled so many persons, both learned and unlearned. The membrane covering the bone has been found highly ulcerated, and the cartilage itself completely decomposed, and even the bones in a state of

decay from cariousness. Besides this, bony adhesions have often taken place between the navicular bone and the pastern, which consequently render this joint altogether unserviceable.

REMEDIES.—Like some other diseases incidental to the horse, the cure of this is very uncertain. The first thing to be adopted is bleeding from the nearest vein. After which a poultice should be applied to allay the inflammation, and the bowels should be kept open. The following purgative should be given in the form of a ball, and repeated as long as is required.

Barbadoes aloes	.	.	5 drachms,
Castile soap	.	.	2 drachms,
Oil of caraways	.	.	8 drops.

The ball should be formed with a little lintseed-meal and treacle.

If this complaint is discovered at its commencement, and before ulceration of the membrane has taken place, a cure may readily be effected; but on the contrary if the membrane is ulcerated before remedies are applied, the difficulty in eradicating it will be exceedingly great, if not impossible. Caries of the bone is certain to take place, and that condition can never be changed. Blistering the coronet has been found beneficial in assisting a cure, by removing the inflammation to another part and expediting the growth of the horny substance. Setons passed through the part, as contiguous to the seat of the disease as possible, have either lessened the complaint or entirely removed it.

But this disease is altogether of so delicate a nature, that we would not advise its cure to be attempted by an unskilful person, as it is one of those which can only be successfully taken up by an experienced veterinary surgeon.

As in all other inflammatory diseases, there is heat in the seat of the navicular bone, and probably in the whole foot. In this complaint the animal suffers much pain, to alleviate which we would recommend *neurotomy*, or cutting out a portion of the nerve, which has in some instances very much reduced the lameness. But at all events it will lessen the sufferings of the horse. In cases of *extreme* lameness, either with or without contraction, then it would be injudicious to resort to this operation; because, if there was ulceration of the membrane or decay of the bone, the increased friction, in consequence of the freer action given to the parts, the feeling of pain being removed, would cause these to progress more rapidly, until complete disorganization of the foot took place; or in all probability the tendon itself would be gradually worn through by rubbing against the roughened surface of the decayed bone.

FALSE QUARTER.

When the coronary ligament is severely cut or divided, it is termed false quarter. In some instances it is eaten through by the application of caustic applied to other wounds and sores of the foot; when this is the case there will be a division of the horn as it grows down, having all the appearance of a sand-crack, or one portion of the horny substance will overlap the other. This is a very bad defect in the foot, and often occasions lameness, and there is very great difficulty in curing it. The coronary ligament is that by which the horn of the hoof is secreted; consequently what must be first attempted is to restore it to the discharge of its healthy function.

REMEDIES.—Caustic has been used in many instances, and found effectual; but nevertheless it is a dangerous remedy, as it has often proved very injurious. Blisters

have also been successfully tried, but they are too often found not to be sufficiently active. The remedy which has proved most successful, is the heated cautery carefully applied to the injured part. The edges of the horn on both sides of the crack should be thinned down, and a thick plastering of pitch spread over the parts so as to hold them closely together, as well as to support the hoofs. This plaster to be kept on undisturbed for at least fourteen days, and then the parts should be carefully examined, to ascertain the condition of the coronet, and whether union of the parts has taken place. Should adhesion not be begun, then it must again be covered up and not looked at for eight days, by which time it will have adhered. During this treatment it would be judicious to strengthen the hoof by the use of a bar-shoe, only great care must be taken that there is no bearing at, or immediately below, the separation of the horn. To secure this against such a result, if the crust be naturally thick, accompanied by strong quarters, then a little of the crust near the part should be pared off, to prevent it from resting on the shoe. On the other hand, if the hoof be weak, an indentation should be made in the shoe itself opposite the part, which will prevent any stress, as well as the danger consequent upon a sudden or violent concussion which might have the effect of again cracking the hoof before it had got firmly united.

In this complaint the horn sometimes grows down entire, but from an unhealthy action in the coronary ligament, it secretes a narrow slip of horn, generally different in appearance from the other parts, usually of a lighter colour. Although this is the case, it may become perfectly strong, but it must always be considered as a defect, and clearly showing that the horse has had sand-crack, and of course predisposed to a return of it. The horse may be fit for all

kinds of work, yet there generally will remain some degree of tenderness in the part, and may produce lameness when the shoe is allowed to press on it ; or when the horse is subjected to hard work, lameness may return.

TREAD, OR OVERREACH.

This is nearly connected with false quarter, and comprehends wounds and bruises of the coronet, usually the effect of the horse either setting one foot upon the other, which not unfrequently happens in the hind feet ; or in the fore feet, by the hind foot *overreaching* the heel when in rapid action and wounding it.

REMEDIES.—Although this is not in general a very serious injury, yet it should be immediately and carefully attended to. The first thing is to wash out any dirt or sand which may have got into the wound, and dry the part thoroughly with a cloth. After which a pledget of tow, wetted with Friar's balsam, should be firmly bound over the wound, which usually proves a speedy cure. If the wound is large or deep, then it may be a necessary precaution to poultice the part for one or two days before digestive ointment or Friar's balsam is applied.

It sometimes happens that a soft tumour will form on the part. This must be poulticed and brought to suppuration. When the whole of the matter has been discharged, the sides of the ulcer should be washed with a weak solution of blue vitriol, (sulphate of copper,) which will have the effect of expediting granulation of the parts ; and a pledget of tow which has been dipped in Friar's balsam will soon effect a cure.

Ignorant farriers are frequently in the habit of applying caustic to wounds of the feet. This should on no account be permitted, as it is very apt to injure the coronary liga-

ment, so as to render it incapable of afterwards secreting healthy horn.

QUITTOR.

A wound of the coronet, whether it proceeds from a tread, or otherwise, should be carefully and immediately attended to ; because if sand or gravel get into the wound, it is likely to produce those deep-seated ulcerations that are termed *pipes* or *sinuses*, which constitute the disease called *quittor*.

But it may also proceed from any wound of the foot, and in any portion of it. In all ulcers matter is secreted, and the part affected cannot possibly heal until the matter is discharged. In wounds of the foot, there is much difficulty in the matter proceeding from ulceration finding its way from under the hoof, which covers the foot with its various complicated parts. The consequence is, it accumulates under the hoof until it has increased to such an extent that it must find escape in some way ; and frequently forces itself out in all directions, separating the little fleshy plates from their connexion with the horny ones of the crust ; or disuniting the fleshy sole from the horny one ; and in extreme cases eats its way deeply into the internal parts of the foot, forming pipes or sinuses, which run in all directions.

If quittor arises from a wound in the lower portion of the foot, the matter which is collected in it after the ulcer has ripened being confined there, issues from it, and induces a separation between the horny and fleshy sole ; and having accumulated in considerable quantity, at length discharges itself at the coronet, generally close to the quarter. This, however, does not manifest itself to any extent, as both the aperture and quantity of matter which oozes out are apparently so insignificant, that they would

lead an inexperienced person to suppose the discharge of little consequence. In this, however, they will be sadly mistaken ; for most serious mischief lurks within, and the difficulty of removing it is extremely great. In this state of the disease, although the fistula is of very small dimensions, yet the effects of this confined matter will have extended over almost the entire quarter, and the horny sole may be separated from the foot. The matter may have penetrated and lodged beneath the ligaments and cartilages of the coffin-joint ; and besides, the pressure of the matter, wherever it has forced its way to, will have formed ulcerations which are most difficult to heal, and the horn which has been thus separated from the sensible parts below will never unite with them again, thus producing an evil of the worst description.

REMEDIES.—It must be evident that this is a case which can only be successfully treated by a skilful veterinary surgeon. In most instances of such cases, it becomes necessary to remove the greater portion of the horny sole, and thereafter restore the healthy state of the tender surface beneath. When this has been effected, the horn will quickly be reproduced. But in cases where much of the sole has been removed, it will take at least six months to restore fully that which has been removed, so that the horse may again be subjected to labour.

To restore the healthy condition of the foot, very active means must be adopted. Caustic applications alone will destroy the ulcerated surface. To ascertain the state of the disease, a probe must be used, and if it touches any of the bones, it is doubtful whether a cure can be effected even by the most skilful. One thing is certain, if it is found when the probe is inserted into the fistulous openings on the coronet, that the direction of the sinuses is backwards, it

is highly probable that the parts may be thoroughly cured ; but if the direction of the pipes be forward, there is great doubt of a cure being accomplished.

Quittor often proceeds from neglecting bruises and injuries of the sole of the foot. When horses have flat feet, and are ridden quickly over a rough, uneven, stony road, the feet are very liable to be injured, and especially by getting a small stone between the shoe and the sole. Narrow webbed shoes are frequently the cause of bruises of the feet, by leaving too much of the sole unprotected. Another cause is, the smith paring out the sole too closely, or pricking the sole while in the act of shoeing, as also pressure of the shoe on the sole, and gravel getting insinuated between the sole and the shoe.

PRICK, OR WOUND IN THE SOLE OR CRUST.

The sole is peculiarly liable to be injured by sharp-pointed stones, flints, and pieces of glass which it may come in contact with on a road. In shoeing, too, a nail may be driven either through the sensible part of the foot, or so near to it in the horn, that it will cause pressure and consequent irritation, probably inflammation, and this may end in ulceration. In all cases of lameness, particularly in those which are sudden, the legs should be examined with great care ; and if no cause can be discovered to account for it, the probability is that its seat is in the foot. The shoe ought to be immediately removed, when very likely the cause will be ascertained. But if it is not at once apparent by the heat of some portion of the foot, then the crust should be rapped all round with a small hammer, and when the part which is affected is touched, the horse is sure to flinch from it ; or pressure applied by pincers will answer the same purpose.

Should lameness occur within two or three days after the horse has been shod, the first suspicion should fall upon the foot. The best of smiths may prick the foot in shoeing, and he that acts honestly in such a case, by at once acknowledging it, or informing the owner, will not deserve blame. It is in concealing or denying the possibility of the thing that causes all the mischief. Because, whenever it is discovered, the shoe should be taken off, and that too with much care. Some foolish smiths are in the habit of wrenching off shoes, a practice which, under any circumstances, cannot be too severely condemned.

REMEDIES.—As soon as the injured part is detected, the sole should be well thinned down around it, and at the punctured spot it should be pared to the quick. We are speaking of one of some days' standing, in which case matter will issue from it, and the sore will be thereby relieved. If the wound is quite fresh, then all that will be necessary after thinning the hoof is to apply a pledget with some Friar's balsam to it; or fill the wound with bees'-wax, and it will quickly heal if kept clean. If, however, it does not heal speedily, and it becomes hot, then inflammation will have taken place, and therefore it will be necessary to apply a poultice.

But in wounds of the foot much depends upon the particular part which has been injured. Although a pretty deep wound is inflicted towards the back part of the sole, and even extending into the frog, still it may not be attended with much danger or inconvenience to the animal, because there is no motion in that portion of the foot, and there are besides no bones or tendons to be injured. Neither is much harm to be apprehended from a prick near the toe. But in the centre of the sole, where the flexor tendons pass over, especially where the tendon is inserted into the coffin-

bone, a puncture may be attended with serious consequences, as well as a wound in the joint which unites the navicular-bone with the coffin-bone. If a wound inflicted in this situation is neglected, the animal may be rendered useless for life. In short, injuries of the foot require the utmost skill to examine their precise nature, as well as the manner in which they ought to be treated.

In searching for a wound, it is not uncommon for the smith to cut away an unnecessary portion of the horn from the bottom of the crust of the sole, and thus leave no hold for the nail of the shoe. In such cases it has frequently taken months before the horny substance was of sufficient substance to hold the nails.

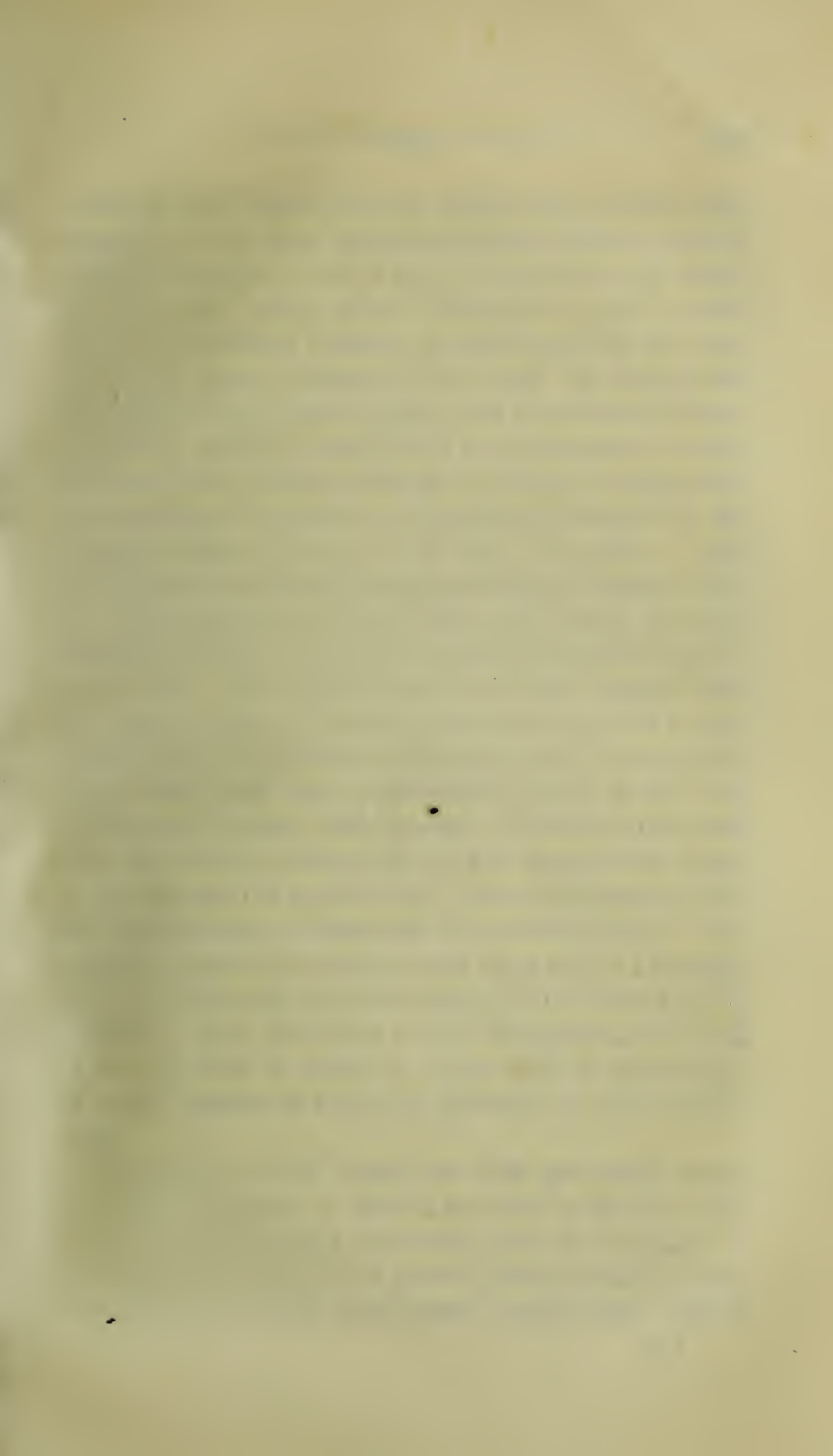
When it becomes necessary to remove any portion of the horny sole in consequence of a wound, or if separation has taken place through suppuration, then the injured or wounded portion of the crust must be entirely removed, as the dead parts of the horn will never unite with that which is living. Then the fleshy sole which has been left exposed must be carefully touched with chloride of antimony, and some soft and dry tow or lint laid on it. But if there are inflammatory symptoms, it will be necessary to apply a poultice to the entire sole. So quickly is the horny substance secreted, that on the following day a thin pellicle will be found covering the whole, or part of the portion that has been stripped of the crust. If it presents a healthy appearance, then it should be very slightly touched with caustic, so as to energize it. But if there are any symptoms of proud-flesh shooting through it, then it must be again subjected to an application of chloride of antimony and tow placed over it as before. In a few days the whole surface will be invested with a horny crust. If there is

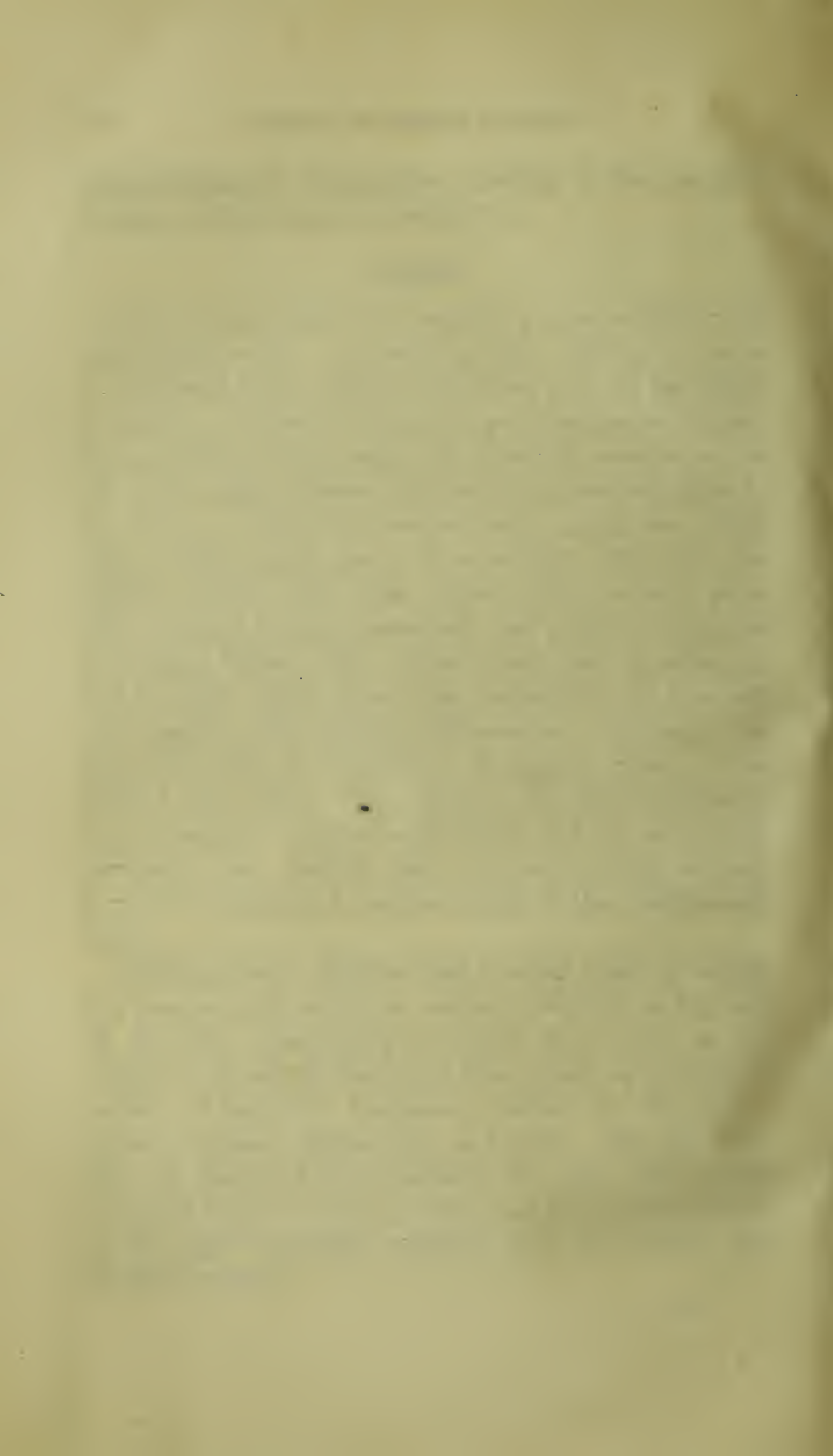
any appearance of inflammation, bleeding at the toe and opening medicines must be resorted to.

CORNS

CAUSE.—This disease has acquired a name which but ill expresses its nature. It bears but little affinity to corns on the human foot ; although, like them, they are the effects of pressure. Instead of being hard as in the human subject, they are thin and very weak, and caused by pressure on the sole in the angle between the bars, as represented, plate 6, fig. 12, *c c*. The horn becomes more spongy and softer than at other parts, and it is so sensitive, that upon the slightest pressure the horse indicates that he feels pain. When the foot becomes contracted, that portion of the sole intervening between the external crust which is wiring in and the bars which oppose that contraction are squeezed very severely, which induces inflammation ; and hence it is that feet which are contracted are almost certain to be afflicted with corns. The effects of this pressure induce a small quantity of extravasated blood, and the horn being secreted in less quantity and of a more spongy texture, it has the tendency to enclose within it this extravasated blood.

Nothing is more injurious than to allow a shoe to remain too long on, as it is sure to become embedded in the heel of the foot ; consequently the crust grows down on the outside of it, and the bearing is thus thrown on the angular portion of the sole. Continued pressure on the sole is certain to induce inflammation and corns. The shoe being long on, wears and gets loosened at the heels, which admits of gravel between it and the crust, and having accumulated in the angle it naturally insinuates itself into the heel, and produces a sore.





As we have before said in another part of the work, nothing can be more injudicious than to allow shoes to remain too long on : even if they are not worn, they should be occasionally taken off and readjusted, to free the feet from long-continued pressure on certain parts by the growing of the horny substance of the hoof. In shoeing, too, the bars are very often cut away, and this renders it necessary to be bevelled inward, so as to accommodate it to this injurious and ridiculous shaping of the foot ; consequently an unnatural disposition to contraction is induced by this slanting inward direction of the heel of the shoe. From this the sole is subjected to double liability to injury ; first, by being pressed upon by the shoe, and, second, by being squeezed between the outer crust and the external portion of the bar. This angle is less able to bear pressure than any other portion of the foot, being more exposed to accidental bruises and injuries of different kinds, in consequence of the shoe being made unnecessarily narrow at the heel. In the act of shoeing, while paring out the foot, the smith is too apt to omit cutting away the horn between the angles of the bars and the external hoof ; and if he does cut away the bars, he hardly touches the horn at this point. Consequently, before the horse has been eight days or a fortnight shod, the shoe rests upon this angle, and the corns are thus produced. It is plain that a shoe thickened at the heels of the fore feet is certain to cause corns, in consequence of undue pressure on the heels, especially in feet that are weak.

There can be little doubt but corns are mainly owing to faults in shoeing, as well as the fact of shoeing itself, however well performed, preventing the due expansion of the horn when the sole is growing downwards, and thus confining and injuring this portion of the sole. And it

is easy to imagine that if the shoe is badly constructed, or allowed to remain too long on, that corns must be induced. This effect will be rendered manifest by an attentive observation of the foot in plate 6, fig. 10. When paring is not attended to in shoeing, or when it is injudiciously extended to the bars, the evil of corns is likely to arise. This unnatural pressure of the sole causes the blood to be thrown out, which enters into the pores of the soft and diseased horn which is then secreted ; and by the colour and softness of the horn at this place, the existence and extent of the corn is judged.

REMEDIES.—The cure of corns is difficult and uncertain, because a diseased action is induced ; and to check this is no easy matter after it has contracted the tendency to secrete diseased horn ; for all shoeing produces pressure on the parts.

The first thing to be done is to ascertain the extent of the corns ; and this can only be effected by paring out the angle between the crust and the bars ; at the same time it will relieve, and to a great extent do away with, what has caused the complaint. This can be best accomplished by the use of a small drawing knife, with which the corn must be pared out to the bottom ; but great care must be exercised not to wound the sole. After this operation, it will be seen whether there is any effusion of blood or matter underneath the corn. If there is reason to believe that such is the case, then an opening must be made through the horn, so that the matter may discharge itself and the separated horn be removed ; and when the course of the sinuses have been ascertained, the same remedies must be employed as in quittor. If there should happen to be no collection of matter, the chloride of antimony should be applied over the whole extent of the corn after the horn

has been thoroughly thinned down, so as to stimulate the parts to throw out a fresh secretion of healthy horny substance.

In bad cases of corns, where the inflammation has rendered the parts very sensitive, a bar-shoe will be of service, so chambered, that there will be no pressure on the part affected. This may be kept on for a couple of months or so, but not longer, as in removing one complaint it might induce another; for few frogs could bear the constant pressure of the bar-shoe; and the heel being subjected to no pressure while they are used, may induce a soft and bulbous condition of the heel, which would be the cause of constant lameness.

In a majority of instances corns are either confined to the inner quarter of the foot, or crust, caused in consequence of contraction being generally seated in the inner quarter. The shoe being left free on the inner side, if a corn exists there, may prove of much advantage if the country is not too heavy, or if the horse is not required to perform rapid movements.

If corns have once existed to a considerable extent, they are liable to return; therefore, before shoeing, the seat of the corn should be well pared out, and the chloride of antimony well rubbed on it. The seated shoe (which we have described in our chapter on shoeing) should be used, with a web sufficiently thick to cover the situation of the corn, and extending as far back as possible without producing injury to the frog. When the horn has grown to some extent, if the horse is turned out to grass with a bar-shoe in the first instance, and afterwards with a shoe fastened on one side only, or with tips, it will frequently prove of much service.

In all cases where horses have low, weak heels, they

should seldom be pared with a knife, but merely rasped down to a level surface. This is peculiarly applicable to the inner heel. The hind feet are seldom affected with corns, because they are stronger than the fore-feet, and less subjected to concussion ; and even where corns do exist, they do not produce lameness.

CANKER.

Canker consists of a separation of the horny substance from the sensible fleshy and bony portion of the foot, caused by the growth of fungus matter shooting up and occupying parts of, or the entire sole of the foot and frog. It is induced either by a puncture, bruise, corn, quittor, or thrush, more commonly proceeding from the latter than any other cause. It seldom attacks high-bred animals, being almost always confined to the heavy breed of cart and dray horses, which class seem to have a constitutional predisposition to this complaint. Those which have previously had grease are peculiarly liable to canker, and especially those which have thick heels. Persons experienced in breeding have long ascertained that grease and canker follow certain blood, and have thus established the fact of these complaints being hereditary. Besides the hereditary predisposition of work-horses to canker, in order to give him *foot-hold*, it becomes necessary to raise the heels of the hinder feet so much that all pressure on the frog is done away with, which has the effect of destroying its functions, and consequently rendering it liable to disease.

But canker is produced chiefly from the very ponderous shoes with which these horses are furnished, and the largeness of the nails with which they are necessarily attached to the feet, together with the strain to which the animals are subjected in drawing and sustaining heavy weights.

The dirty state of many of the stables, and the neglect of the feet generally, are fertile sources of this bad disease. Attention to these points might in many instances prevent the malady, but when once it has been induced, it is extremely difficult to remedy.

It is peculiarly necessary to give a watchful attention to all species of injuries in these heavy horses, as they are more likely than all others to assume a bad complexion. Their feet being clubbed, and their hoofs in general brittle, they are liable to be punctured while shoeing. Nine-tenths of the complaints of this kind arise from negligence either in the groom or master, and also from the carelessness or stupidity of the shoeing smith. It will only require a little attention to the subject to enable the master to detect where the mischief arises.

REMEDIES.—Canker is a complaint which ought only to be undertaken by a veterinary surgeon, being exceedingly difficult and tedious in its progress towards a cure.

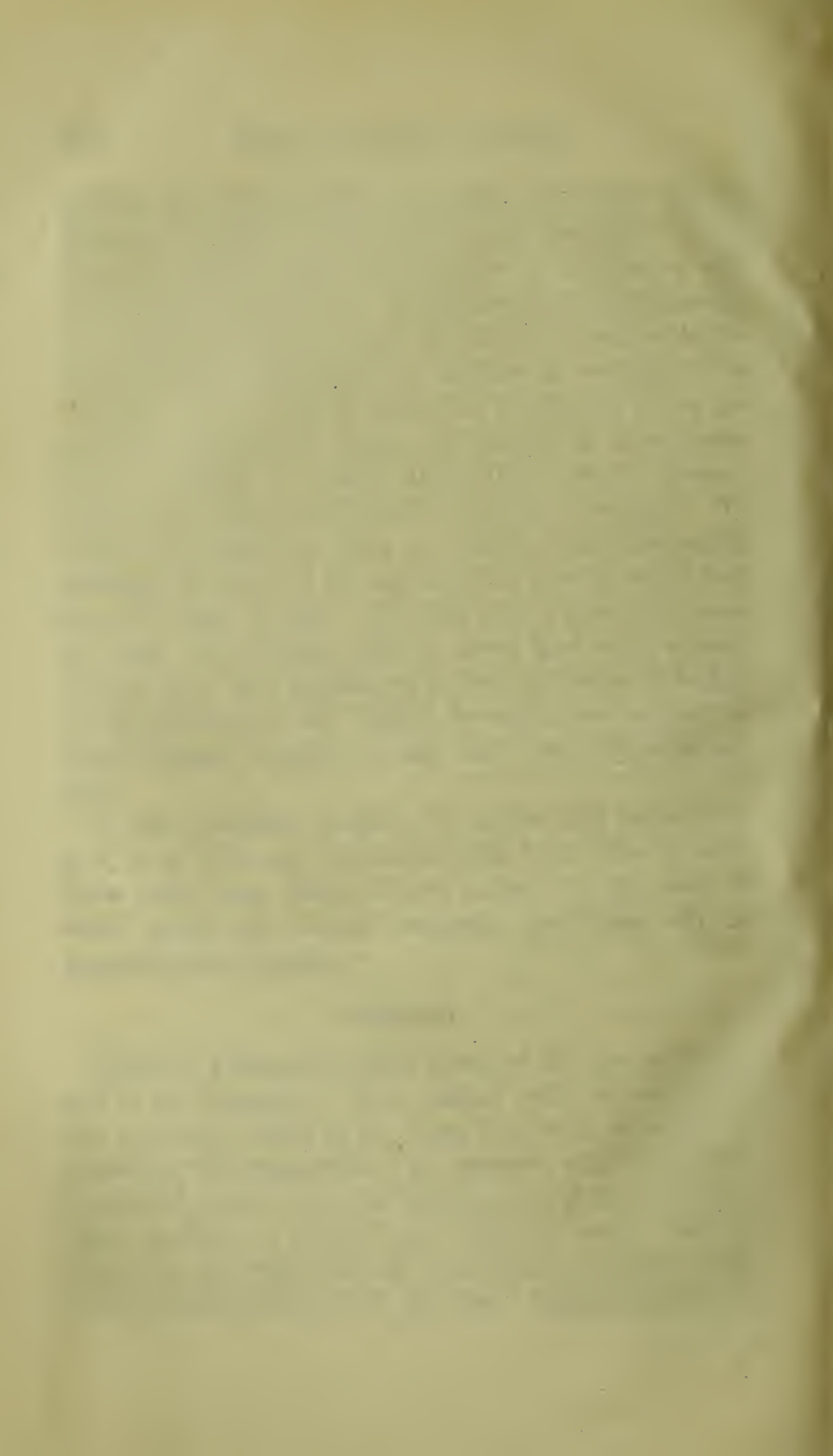
The first thing which is done in this disease is to cut out the fungus growth; and besides this it often becomes necessary to use both caustic and the cautery; and all that portion of the horn which has been separated from the fleshy and bony parts must be carefully removed. Should fresh fungus be generated, it must be got rid of, and means adopted to check its growth, and by proper applicants to induce the secretion of healthy horn. Unskilful veterinarians have been known to inflict severe and unnecessary torture on horses which had canker, by too deeply corroding the parts with caustic, and thus producing a sore. He that is an adept at his profession will know that canker is only a superficial disease, and does not extend to the bony or fleshy parts; therefore a very slight daily application of chloride of antimony will suffice to

produce the desired effect, if, besides, a firm and uniform pressure is applied, and nothing moist permitted to rest upon the surface, which would be sure to be attended with very serious consequences. In this complaint gentle exercise is absolutely necessary where the disease is confined to the frog and sole of the foot, but moisture is carefully to be avoided. But it will be found that in effecting a cure the processes will be both tedious and painful, in consequence of the necessity of caustic applications, which, however slight, always cause considerable irritation in the parts. To relieve the animal as much as possible from unnecessary suffering, the nerve of the leg should be divided, which will stop the sense of pain. But after this is done, care must be taken not to expose him to severe hard work, or even contact with hard substances, as from the sense of feeling in the foot being so far blunted, he may batter the hoof to pieces without knowing it, and also bruise the cankered parts.

In this complaint medicine is seldom had recourse to, as it is of little use, the disease being local. But it sometimes occurs that grease follows canker; in the event of which physic will become necessary, and these will be alteratives and diuretics.

THRUSH.

Thrush is a disease to which horses of all ages are liable, and in all situations. Even unshod colts are subject to this complaint, caused by the horny frog being subjected to pressure by the contraction of the quarters, which is thereby diminished in size; and the lower portion of the fleshy frog being confined, is irritated and inflamed, which induces ulceration, and when matured is manifested by matter being discharged from the cleft of the frog. During this state of



inflammation the lower surface of the sensible frog secretes pus instead of the horny substance, which is its proper function. When the frog is in a healthy condition, the cleft sinks but a small way into it. Contraction, however, or any other disease, affects the cleft so that it extends in length and often penetrates deep into the sensible horn within, and it is through this diseased and deepened fissure that the matter from the thrush discharges itself. Any complaint which affects the healthy condition and action of the frog, is almost sure to induce thrush. Differing from most diseases of the foot, thrush is generally more severe in the hind than in the fore feet. This can only be accounted for by bad stable management, and that the hind feet are subjected to being so much exposed to the baneful consequences of immersion in the dung and urine, producing irritation, and generating disease. Besides, the hind feet are further removed from the centre of circulation than the fore, which consequently subjects them to the accumulation of matter and grease, as well as other affections to which they are liable. Contraction is generally the cause of thrushes in the fore feet. Wiring-in of the heels will produce pressure on the frog, and cause pain and inflammation.

A horse may have thrush without being lame, and it often happens that no alteration whatever can be seen on the foot thus diseased, and it may require a close inspection to detect that it is affected. But it will always be manifested by the disagreeable and peculiar smell which invariably accompanies the complaint. In some cases no tenderness of the frog attends thrush, and therefore the horse is not reckoned legally unsound by many persons. This we, however, consider strange, as it is a complaint which may, and indeed is likely to assume a worse aspect,

particularly if not remedied in time, and hence may lead to positive unsoundness. But it is only in cases where considerable alteration in the form of the hoof has taken place, that thrushes are likely to be of a severe kind; for we find that they may exist in an otherwise sound and well-formed foot, without being attended with immediate detriment, and may be easily remedied. Still, if the thrush be not removed, in the course of time it will alter the shape of the foot and also the action of the animal, and consequently becomes confirmed unsoundness. It is quite certain if thrush is neglected, that however slow its progress may be, still it is sure ultimately to assume a serious and immovable complaint. The frog will contract, become rugged and tender, and will be followed by a copious and very fetid discharge, the horn will gradually disappear, and in its stead there will be accumulated a mass of hardened mucus, which easily comes off, and leaves the sensible frog completely exposed and unprotected; it is so tender that the slightest touch gives exquisite pain to the horse. In a day or two fungus granulations shoot out from it and spread in all directions, affecting even the sole; and this canker invests the entire foot.

From this will be seen the extreme folly of neglecting thrush, however simple its aspect may be at first. We have known valuable horses having been lost to their owners from the erroneous belief entertained by themselves, or put into their heads by ignorant quacks, namely, that thrush would benefit the horse, as it was only Nature working its own cure by throwing off superabundant humours. Some ignorant country smiths, who call themselves farriers, have promulgated such a doctrine, and even recommended that the discharge should not be speedily dried up on this account; and some have even said that it should not be

dried up at all. But, assuredly, in nine cases out of ten, what we have pointed out will be the inevitable consequence of neglected thrush. Its operations are slow, but its effects are certain. Disease of all kinds should be instantly attacked, and speedily subdued if possible.

REMEDIES.—Astringents generally are the best appliances to thrush; but those of a caustic nature are to be avoided. The foot should be carefully examined, and when the cause of the thrush has been ascertained, our first attention should be directed to the cure of that. And previous to commencing any treatment, the frog should be forthwith freed from all portions of hardened mucus, as well as loose pieces of the horny substance. Then the following liniment should be applied :—

Honey	.	.	.	.	4 ounces,
Verdigrise	.	.	.	.	1 ounce,
Vinegar	.	.	.	.	$\frac{1}{2}$ pint.

Let these be boiled for a few minutes, and the composition applied to the place from which the discharge emanates. This is, however, a mild application, and will be somewhat slow in effecting a cure. But the most speedy, yet safe, appliance is the following :—

Blue vitriol	.	.	.	.	2 ounces,
White vitriol	.	.	.	.	1 ounce,
Tar	.	.	.	.	1 pound,
Lard	.	.	.	.	1 pound.

The vitriols to be finely powdered, and then mixed with the tar and lard.

A pledget of tow covered with the above should be inserted every evening as deeply as possible into the cleft of the frog, and renewed every day. If it is necessary to

work the horse, then it should be taken out every morning and a new one applied after the labour of the day. Should the frog be much exposed, besides the pledget which is to be put into the crack, a larger piece of tow should be spread over with the above liniment, and applied over the whole exposed surface. Care must be taken not to force the pledget too hard into the cleft to press upon the tender part below, and during the treatment recommended it will be proper to keep the frog moist. This will be best effected by filling the cavity of the under surface of the foot with tow, covered by common stopping, or by placing on a felt pad, covered by the same material.

In cases of thrush the feet should be kept dry; and, contrary to the practice of some, who recommend turning out to grass with this complaint, we prefer keeping the animal in the stable until a cure is effected.

OSSIFICATION OF THE CARTILAGES.

These cartilages occupy a considerable portion of the back part and side of the foot, as represented on plate vii., fig. 7, *h*. Their use is to preserve the expansion of the upper portion of the foot; they also sustain those parts when they are either limited or destroyed by shoeing. They are liable to inflammatory attacks, which induce absorption in them, and bony matter is exuded in their stead. This ossified condition of the cartilages is frequently connected with ring-bone, but it often exists without any affection of the pastern-joint. Horses that are subjected to heavy draughts are most liable to this complaint, which no doubt originates in a sprain rather than concussion. But the real cause is not well understood, although many are the instances of draught-horses being affected with this complaint.





SYMPTOMS.—When the foot is in a healthy condition, the back cartilages will yield to the pressure of the fingers on the coronet over the quarters. But when ossification commences, and the complaint progresses, then a commensurate degree of resistance manifests itself, and in process of time it will no longer yield to any pressure. It is then certain that complete ossification of the cartilages has taken place. During the transformation of the cartilage into bone no visible inflammation is observable in the foot, nor does much lameness appear; and indeed frequently lameness is not at all manifested, although a slight stiffness may be noticed. These observations apply to cart-horses, or such as require only to be worked at a slow pace; but in horses that go at a rapid pace, it amounts to positive lameness. When this complaint is connected with ringbone, very great lameness is the consequence.

REMEDIES.—Unless this disease is taken at its commencement, no treatment can avail; for the bony deposit once having taken place, there is no possibility of restoring the cartilage. When it is detected in its first formation, blisters and the use of the cautery may arrest its progress, and entirely remove it. We know of no other application, except rubbing the cartilage smartly with iodine morning and evening, which may restore the action of the secreting vessels to a healthy state.

WEAKNESS OF THE FOOT.

This is merely a conventional term in general use among horsemen and dealers, which might with more propriety be denominated “malformation of the foot,” because, in point of fact, it is rather a bad formation than a disease. In many instances it is a natural infirmity, and likewise proceeds from some other disease. The natural slant or angle of the

well-formed crust from the coronet to the toe, is an angle of forty-five degrees ; but in this formation the angle will not exceed from thirty-eight to forty degrees. This inclination is but ill adapted for resisting the effects of pressure ; and consequently, after the animal has been worked for one or two years, the line of inclination, instead of being straight, becomes hollowed half-way between the coronet and the toe ; a defect that also occurs in pumiced feet. The surface presents an irregularly rough appearance, but is more frequently roughened in circles or rings ; and the general structure of the crust assumes a conical form, with the lower portion, or sole, presenting an unnaturally wide aspect ; and in most instances the foot is larger than it ought to be.

In this ill-formed foot the sole is always so flat that it will not stand paring when the horse is shod, and it will be found that the bars are very small in size, indeed in many cases they can hardly be said to exist ; the heels are so low that the coronet appears almost to touch the ground, and the crust is so thin that it will hardly be capable of holding the nails of the shoe. Little good can be expected from horses with such feet. Besides, they are certain to be liable to corns ; also to frequent bruises and convexity of the sole ; to the crust being broken ; to sprain and injury of the pastern, the fetlock, and flexor tendons ; and to punctures from the nails in the operation of shoeing.

Feet of this construction are susceptible of little or no improvement. To those who have the misfortune to possess horses with these feet, we can only recommend that which we have condemned in the healthy state, namely, to shoe them as seldom as possible. The web of the shoe should be light and concave ; the foot should be as sparingly pared

as possible ; hard work and rough roads are carefully to be avoided. With these precautions the animal may work for a considerable time ; but an evil day must arrive, and the animal will turn out utterly worthless.

CHAPTER VIII.

THE ANATOMICAL STRUCTURE OF THE HORSE.

It is not our intention to go deeply into the anatomy of the horse, as this would far exceed the limits of such a work as the present, and indeed would not be suitable for a popular treatise. We shall therefore confine ourselves to such an outline of his structure as will convey a pretty general idea of what is truly useful to possessors of horses in general.

We may briefly state, that the bones of the skeleton and the muscles which cover them are all double, if we except a very few bones which lock the two halves together ; and that if an animal is divided correctly into two halves, these will be found exactly similar in the number of bones and the muscles with which they are covered. But this does not extend to the internal organization in general, although a few of its parts are also double.

DIFFERENT BONES OF THE SKELETON OF THE HORSE.

PLATE II.

Instead of giving the bare skeleton of the horse, we have considered it better to exhibit an outline of the external

form of the animal, which will convey a more correct idea of the situation of the different bones as embodied in the muscles ; and by comparing this view of the skeleton with our representation of the perfect horse in plate 1, the reader will have little difficulty in ascertaining the position which the various bones occupy under the superincumbent muscles.

FIG. 1, 1. The seven cervical vertebræ, or bones of the neck.

2. The sternum, fore part of the chest, or breast-bone.

3. The scapula, or shoulder-blade.

4. The humerus, or bone of the arm.

5. The radius, or bone of the fore-arm.

6. The ulna, or elbow.

7. The cartilages of the ribs.

8, 8, 8. The costæ or ribs, seven or eight of which unite with, or are articulated to the sternum—these are called the *true ribs* ; and ten or eleven are united together by cartilages, and are called the *false ribs*.

9. The carpus, or knee, consisting of seven bones.

10, 10. The metacarpal, or shank-bones : the larger metacarpal, or cannon, or shank-bone, in front, and the smaller metacarpal, or splint-bone behind.

11. The upper pastern.

12. The lower pastern.

13. The coffin-bone.

14, 14. The eighteen dorsal vertebræ, or bones of the back.

15. The six lumbar vertebræ, or bones of the loins.

16, 16. The haunch, consisting of the ilium, the ischium, and the pubis.

17, 17. The femur, or thigh-bone.

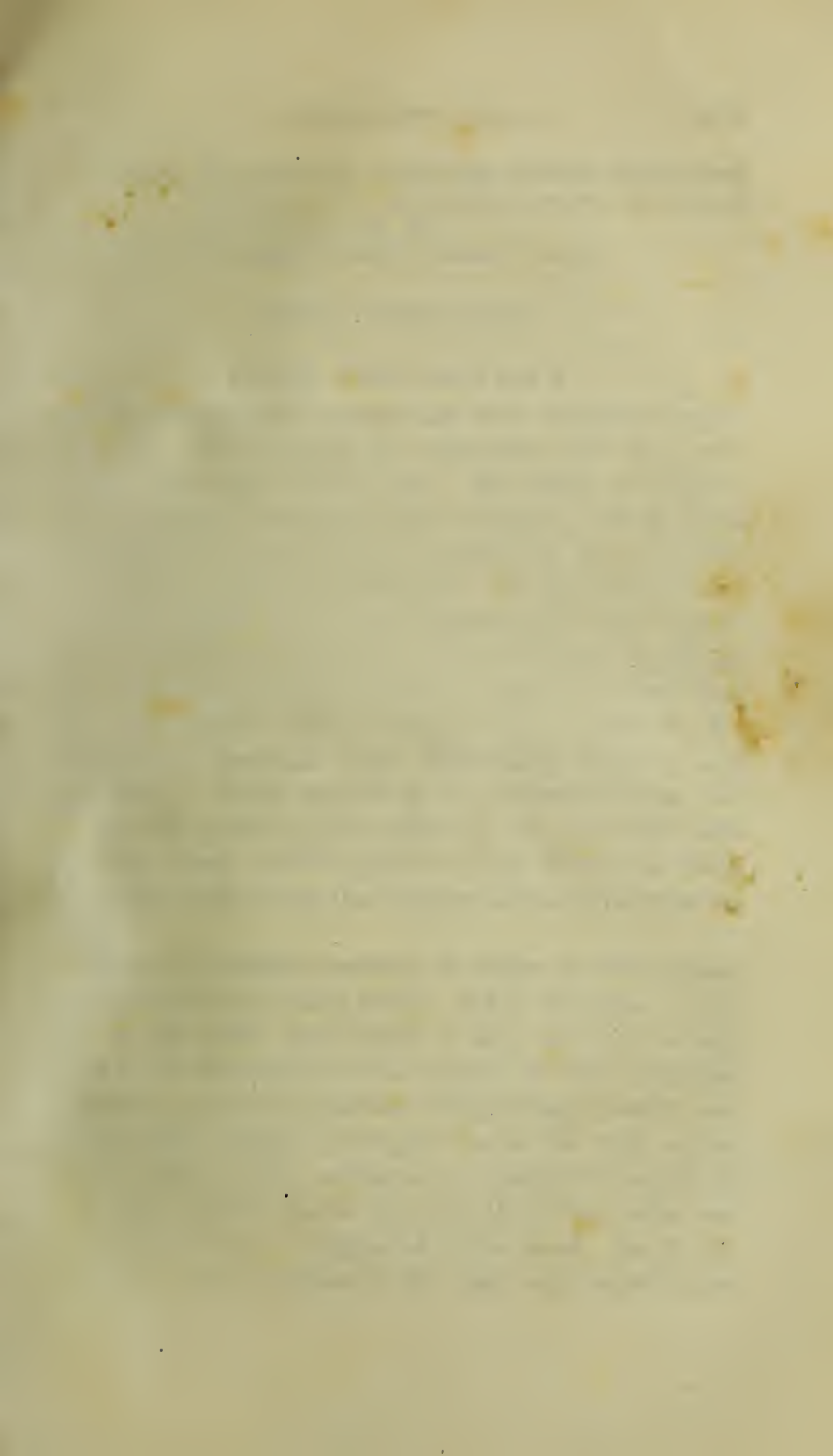
18, 18. The stifle-joint, with the patella, or knee-cap.

19, 19. The tibia, or proper leg-bone.

20. The fibula.

21, 21. The tarsus, or hock, composed of six bones. The prominent part behind is the os calcis, or point of the hock.

22. The metatarsal bones of the hind legs.



- 23, 23. The pastern of the hind feet, including the upper and larger bone, (fig. 23,) the lower pastern, (fig. 25,) and the coffin-bone, (fig. 24.)
- 26, 26. The caudal vertebræ, or bones of the tail.

BONES OF THE HEAD.

PLATE VIII. FIG. 2 AND 3.

The head contains the brain and other important organs of sense. It is divided by anatomists into two parts, namely, the skull and the face. The skull, or cranium, is that portion in which the brain is situate ; and the bones in which it is enveloped are destined for its protection. This division consists of nine bones : the two frontal bones, *a, a* ; two parietal, *c, c* ; two temporal, *d, d* ; the occipital, *g* ; the ethmoid ; and sphenoid : the two latter are situate at the base of the skull, and are not visible in a front view, but their position will be seen in fig. 3, plate iii., the ethmoid, or sieve-like bone, immediately above *k*, and sphenoid, *l*. These nine bones are separated in the foal at an early period of its existence ; but soon after birth they are firmly united together by the sutures, at which parts they are so strong that fracture seldom or never occurs there.

There is a beautiful evidence of design in this division of the head into so many bones. When the foetus of the foal in the womb first assumes a form, and may be said to be in life, this portion of the skull is merely a jelly-like consistence, which is gradually changed into a harder substance, called cartilage ; and previous to the birth of the animal much of this cartilaginous substance is carried off by certain vessels emanating from the brain, called absorbents, and bone is deposited in its stead. In all the flat bones, such as those of the head, this deposit takes

place from the centre, from which radiations, or rays of bone shoot forth in all directions. Therefore it is evident, that by having so many bones, there are so many more centres of radiation, and consequently the formation of bone is carried on so much more rapidly, and becomes perfected at the time when the necessities of the animal require it. But when the foal is born, this process is not completed, as the edges of the bones remain somewhat soft and pliant; so that in parturition they yield a little, and by overlapping each other render the birth more easy, and save the parent much pain, and contribute materially to the safety of the foal; and indeed without a change in the form of the head, from this compression and yielding of the bone of which it is composed, the animal could not be born.

a. The occipital bone, or bone of the hinder part of the head.

b, b. The parietal bones, or walls of the skull.

c, c. The temporal bones, or bones of the temple.

d, d. The temporal fossa, or pits above the eye.

The age of a horse is pretty well manifested by the depth of these fossa. At the back part of the eye there is a cushion of fatty matter on which the eye rests, and revolves without friction. In aged horses this substance decreases, and consequently the eye sinks and the pit above it deepens. To deceive the unwary, dishonest dealers puncture the skin of the pit, and with a blow-pipe fill up what it has lost in substance with air. This puffed-up skin will continue for many hours. The name which is given to this by these unprincipled men is "*puffing the glims.*"

e, e. The frontal bones, or bones of the forehead.

The frontal bones are articulated together by a curious and very intricate dove-tailed suture, which gives great strength, so as to defend the upper portion of the brain, which lies immediately below them, from injury. The frontal bones

strongly manifest the breed or blood of a horse. Those which are high-bred have a broad angular forehead, with the face gradually tapering from the brow to the muzzle, as represented in this figure. The cranium of the dray or cart-horse is nearly as wide below as above. It is the full and largely developed forehead which gives to the blood-horse that fiery and intelligent expression.

f, f. The zygomatic arch.

g, g. The super-orbital foraminæ, or holes above the orbit for the passage of the nerves and blood-vessels which supply the forehead. The small hole beneath receives vessels which penetrate into and supply the bone. In some craniums there are several such holes.

h, h. The lachrymal, or tear-bones.

i, i. The orbits which contain and defend the eye.

j, j. The malar or cheek-bones.

k, k. The nasal-bones, or bones of the nose.

l, l. The superior maxillary, or that portion of the upper jaw containing the molar teeth or grinders.

m, m. The infra-orbital foraminæ, or holes below the orbits, through which pass branches of nerves and blood-vessels to supply the lower portion of the face.

n, n. The openings into the nose, with the bones forming the roof of the palate.

o, o. The inferior maxillary, the lower portion of the jaw-bone, which is a separate bone in quadrupeds, containing the incisors or cutting teeth and the upper tusches at the point of union between the superior and inferior maxillaries.

p, p. The upper incisors, or cutting teeth, or, as they are otherwise called, the nippers, a term which we limit to the two central ones above and below; the one next to these, on each side, are called the dividers, and the innermost ones on both sides are termed the corner incisors. There are in all twelve incisors in the head of a horse, viz., six in the upper, and six in the under jaw.

SIDE VIEW OF THE CRANIUM.

PLATE VIII. FIG. 2.

b. The parietal bone

- e.* The frontal bone; the cavities or cells below which are called the frontal sinuses.
- f.* The zygomatic arch.
- g.* The super-orbital foramina.
- h.* The lachrymal bones.
- i.* The orbit which contains the eye.
- k.* The nasal bone.
- l.* The superior maxillary bone.
- m.* The infra-orbital foramina.
- n.* The opening into the nose.
- o.* The inferior maxillary.
- p.* The upper incisors or cutting teeth.
- q, q, q.* The molars, or grinders of the upper and under jaw.
- r.* The posterior maxillary or under jaw.
- t.* The lower portion of the under jaw.
- u.* The under incisors, or cutting teeth.

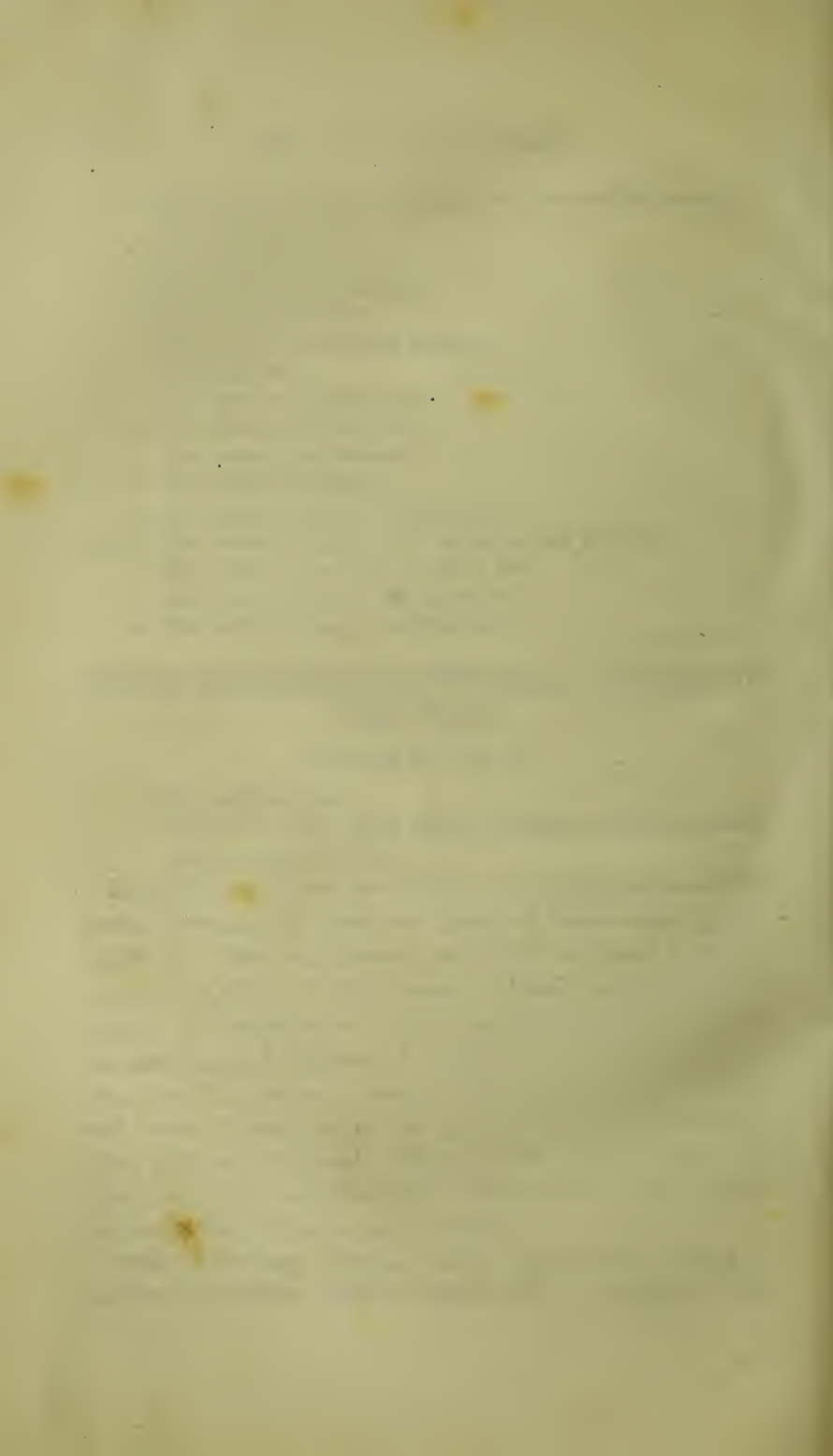
SECTION EXHIBITING THE INTERNAL ANATOMY OF THE HEAD.

PLATE III. FIG. 3.

- a.* The occipital bone.
- b.* The frontal bone, under which are cavities called the frontal sinuses, marked 16, 16.

These frontal sinuses are cavities intervening between the frontal bone and a transverse plate of bone which grows within it. They communicate with the cavities of the nose, as also with those of the sphenoid, ethmoid, and upper jaw-bones. In consequence of this conformation, they increase the loudness and clearness of neighing. It sometimes happens that the larvæ of certain flies crawl up the nostrils and locate themselves in the frontal sinuses, occasioning great pain to the animal. Happily, this is not of very frequent occurrence with the horse, although sheep and horned cattle are more liable to such intrusion.

Some veterinary surgeons have made these sinuses a medium to discover whether horses with a running at the



nostrils were glandered. An opening is made into these sinuses, which may be effected with perfect safety. Suppose a line to be drawn across the forehead from 2 and 3, one foramen to the other, plate viii. fig. *g, g, g*. On that line, and about half an inch from the suture, or line which separates the frontal bones, the sinuses or cavities are situated, and extend to an inch in depth, as represented in plate iii., fig. 3, immediately under *b*, and marked 16, 16. If the position of *g, g* in fig. 3, plate viii., and *b* in fig. 3, plate iii., are compared, a perfect idea of their seat in the forehead will be formed. At this part a small perforation is made, into this warm water is injected by means of a common squirt, which will run out at the nostrils. If there be matter either in the sinuses or nostrils, it will be found mixed with the water. If it presents the appearance mentioned at page 19 and sinks, then it is certain the animal is glandered.

- c*. The nasal bone, or bone of the nose.
- d*. The tentorium, or bony separation between the cerebrum and cerebellum.
- e*. The occipital bone.
- f*. The cerebrum, or brain.
- g*. The cerebellum, or little brain.
- h*. A portion of the medullary, or marrow-like substance of the brain; and the prolongation of it, which bears the name of the *crus cerebri*, or leg of the brain, and from which many of the nerves emanate.
- i*, and *m*. The ligament of the neck, or pack-wax, by which the head is chiefly supported.
- j*. The sphenoid, or wedge-like bone, with its cavities.
- k*. The cuneiform, or wedge-shaped process, or base of the occipital-bone. Between it and the other portion of the occipital-bone, *a*, lies the great foramen or aperture through which the prolongation of that portion of the brain called the spinal-marrow issues from the cranium, and is continued through the spine or back-bone.

- l.* The *medulla oblongata*, a prolongation of the brain after the marrow-like substance of the cerebrum and cerebellum have united, and forming the commencement of the spinal marrow. This portion has a ropy appearance.
- n.* The point of the atlas bone which sustains or carries the first bone of the neck.
- o.* The first bone of the neck.
- p.* The dentata, or tooth-shaped bone, the second bone of the vertebral column.
- q.* The cartilage covering the entrance into the eustachian tube, or communication between the mouth and internal part of the ear.
- r.* The spinal marrow, extending through a canal in the centre of the bones of the neck, back, and loins, to the extremities of the tail, and from which the nerves of feeling and of motion which supply every part of the frame arise.
- s, s* The *septum-nasi*, or cartilaginous division between the nostrils.

When the nostril is opened, the membrane by which the cartilage and whole cavity of the nose is lined is seen. By the colour of this membrane, much more than by the lining of the eyelids, we may judge of the degree of fever, and especially of inflammation of the lungs or any of the air-passages. We also determine by the ulcerations which are seen on this membrane, the existence of glanders. This cavity on both sides is occupied by two bones, which, in consequence of being rolled up in the form of a turban, are called the turbinated bones.

- t, t.* The *septum-nasi*, cut off at the lower part to exhibit the spongy turbinated or turban-shaped bones, filling the cavity of the nostrils. Part of the cartilage is removed to display them. They are as thin as gauze, and, like it, perforated into a thousand holes. Between them are left sufficient passages for the air.

If these gauze-like membranes were unrolled, they would present a very considerable surface. On every part of them there is spread the pulpy substance of the olfactory, or first pair of nerves, and are the organs of smell. The design of

this expansion of the olfactory nerves is to supply the place of touch, and what is acquired by experience by man. It is by this exquisite sense of smell that the horse selects such food as is best calculated for his nutriment, and is enabled to reject what is poisonous. By smell he judges of the quality of his food in a domestic state, and examines a stranger. The horse will recognise his master or favourite groom by the sense of smell, and frequently expresses such recognition by a neigh. These cavities are also the organs of voice; the sound reverberates through them, and increases in loudness as through the windings of a French-horn. All the air which passes to and returns from the lungs must go through the nostrils, as he can breathe through the nose only. The nostrils ought therefore to be large and expanded. The skin also which covers them should be thin and elastic, that they may the more readily yield when the animal requires a greater supply of air while trotting hard or galloping. In the race-horse the nostrils are wide and flexible, while in the cart-horse they are confined, and surrounded by a quantity of cellular substance and thick skin.

There are besides four distinct cartilages attached to the nostrils, which are exceedingly elastic, and bring them back to their ordinary dimensions whenever the muscles cease to act. The bones also of the nose, *n*, plate viii. fig. 2, and *n n*, fig. 3, are tapered off to a point, to give a wider range for the action of the muscles; while the cartilages are so constructed as not only to discharge the office above referred to, but also to prevent this tapering point of bone from injury.

u. The palate.

v. The inferior maxillary-bone, containing the incisor teeth, or nippers.

- w.* The molar teeth, or grinders.
- x, x.* The tongue.
- y.* The posterior maxillary, or jaw, with its incisors.
- z, z.* The lips.
- 12. The upper incisory teeth.
- 13. The lower incisory teeth.
- 14. The posterior maxillary, or jaw-bone.
 - 1. The thyroid, or helmet-shaped cartilage, enclosing and protecting the contiguous parts.
 - 2. The epiglottis, or covering of the glottis, or aperture of the windpipe.
 - 3. The arytenoid, or funnel-shaped cartilages, having between them the aperture leading into the trachea, or wind-pipe.
 - 4. The trachea, or wind-pipe, with its rings.
 - 5. One of the *chordæ vocales*, or cords concerned in the voice.
 - 6. The *sacculus laryngis*, or the sac or ventricle of the larynx, or throat, for the modulation of the voice.
 - 7. The opening from the back part of the mouth into the nostril.
 - 8. The soft palate at the back of the mouth, so constructed as nearly to prevent the possibility of vomiting.
 - 9. The muscle of the neck, covered by the membrane of the back part of the mouth.
 - 10. The cricoid, or ring-like cartilage below and behind the thyroid.
 - 11. The œsophagus, or gullet.
 - 15. A portion of the *os hyoides*, or bone of the tongue.

REPRESENTATION OF THE PALATE AND TEETH.

PLATE III. FIG. 2.

- a, a.* The tushes canines, or tusk-formed teeth
- b, b.* The incisors, nippers, or cutting teeth.
- c, c.* The palatine nerve between the artery and the vein.
- e, e.* The palatine artery. It is from this artery that blood is taken when horses are seized with megrims, as described at page 7.
- d, d.* The palate, divided into ridges and bars.
- f, f.* The palatine vein.



- c, g.* A strip of the palate, dissected up, to exhibit the position of the vessels and nerve beneath.
- h, h.* The cheeks.
- i, i.* The molars, or grinding teeth.

EXTERNAL ANATOMY OF THE HORSE'S HEAD.

PLATE III. FIG. 1.

- a, a.* The *orbicularis* muscles, surrounding the eye, and destined for the purpose of closing the eyelids.
- b.* The *nasalis labii superioris* takes its rise from a depression at the junction of the superior maxillary and malar bones, and extending to the angle of the nostril. Its use is to raise the lip, and dilate the nostrils.
- c.* *Dilator magnus*, or great dilator, which assists in the office of retracting the upper lip and in dilating the nostrils.
- d.* *Dilator naris lateralis*, or side dilator of the nostrils, reversed to exhibit the vessels and nerves which it covers, extending from the covering of the nasal and frontal bones to the angle of the mouth and side of the nostril. Its office is to retract the upper lip, and dilate the nostrils.
- e.* The *zygomaticus*, extending from the zygomatic arch and masseter to the corner of the mouth, for the purpose of drawing back the angle of the mouth.
- f, g.* The *orbicularis oris*, or circular muscle of the mouth. This muscle surrounds the mouth for the purpose of closing the lips and dilating the nostrils.
- h.* The *buccinator*, or trumpeter muscle, extending from the inside of the mouth and cheeks to the angle of the mouth, to draw it back.
- i.* *Depressor labii inferioris*, or puller down of the under lip, attached to the sides of the under lip to pull it down.
- j.* Branches of nerves, with small blood-vessels.
- k.* The parotid duct, penetrating the cheek to discharge the saliva into the mouth.
- l.* See letter *r*, and explanation.
- m.* The vein and artery passing under the zygomatic arch.
- n.* A branch of the fifth pair of nerves, the sensitive nerve of the face, emanating from under the parotid gland.

- o. The *masseter*, or chewing muscle. This muscle occupies the entire cheek of the horse, and is exceedingly powerful, extending from the upper jaw-bone into the rough surface round the angle of the lower one ; which, in conjunction with the temporal muscle, is destined to chew the food and close the mouth.
- p. The *stylo-maxillaris*, or styloid, pencil-shaped process of the occiput, extending to the angle of the jaw. Its office is to pull the jaw backwards and open it.
- q. The maxillary gland, or gland of the lower jaw, with its duct.
- r. At this situation the submaxillary artery, a branch of the jugular artery and the parotid duct, pass under and within the angle of the lower jaw, and reappear again at *l* ; and, ascending the cheek, are distributed in a branching manner over it.
- s. The *subscapula hyoideus*, emanating from under the shoulder-blade to the body of the *os hyoides*, to draw back that bone.
- t, w. The *sterno maxillaris*, or muscle belonging to the breast-bone and upper jaw, from the cartilage in front of the chest to the angle of the lower jaw, for the purpose of bending the head ; or, if one only act, to bend it on one side.
- u. The *levator humeri*, or elevator of the shoulder, arising from the tubercle of the occiput, the mastoid, or nipple-shaped process of the temporal bone ; and the transverse processes of the four first bones of the neck and the ligament of the neck, and proceeding to the muscles of the shoulders and the upper bone of the arm, for the purpose of drawing forward the shoulder and arm, or to turn the head and neck ; and, when the two levators act, to depress the head.
- v. The jugular, or neck-vein. It is from this vein that blood is taken for all diseases in the head, neck, and contiguous parts.
- x. The tendon common to the *complexo major*, or larger complicated tendon ; and the *splenius*, or splint-like tendon, and the mastoid process of the temporal, to hold up the head, or, the muscles on one side alone acting, to turn it.
- y. The superior portion of the ligament of the neck.

- z. The superior portion of the parotid gland, or gland situate near the ear, reversed to exhibit the blood-vessels and nerves beneath it.

MUSCLES AND PARTS CONNECTED WITH THE EYE.

PLATE III. FIG. 4 AND 5.

The horse has a very extended field of vision. The eye is provided with seven muscles to move it in all directions ; and that they may act with sufficient promptitude and power, no fewer than six nerves are directed to the eye generally, or to particular muscles ; and that it may receive no injury from friction, it rests upon a mass of fatty matter, which also enables it to be turned without much exertion of the muscles. Four of the muscles, *a*, *e*, and *d*, are straight ; these rise from the back of the orbit, and are inserted into the ball of the eye, immediately opposite, and at equal distances from each other. One of these, *f*, rises to the upper part of the eye, immediately behind the transparent and visible portion of it, the office of which is to raise the eye. When it contracts, the eye must necessarily be drawn upward. Another, *a*, is inserted immediately opposite, at the bottom of the eye, for the purpose of depressing the eye, or enabling the horse to look downwards. A third, *e*, is inserted at the outer corner, which turns the eye outward ; and a fourth is inserted at the inner corner for turning the eye inwards. By means of all these the eye can rotate, or be turned in any direction at the will of the animal. Should the animal wish to look upward and outward, then the outer and upper muscles are called into action, and can be modified in any manner at the will of the horse. These muscles perform another duty, namely, keeping the eye in its place, for while grazing the principal weight of the eye rests upon them ; and to aid them in this, another

muscle, *d d*, called the retractor, is added ; it arises from the edge of the foramen, through which the optic-nerve enters the orbit. The use of this muscle is to support the eye generally, or when it is suddenly called into great action, and aided by the straight muscles, it draws the eye back out of the reach of danger, and in the act of drawing it back it forces the haw to protrude in the manner already described, as an additional defence. The cornea, *i*, is the only visible part of the eyeball of a horse, or at least it should be ; and it is said that where much white is seen, that it is an indication of bad temper. The pupil, *k*, in the horse differs in form from that of all other animals. It is of an elongated, oblong, ovate form, and placed transversely, as represented in fig. 4, plate iii.

The eye is a very important organ in the horse. It ought to be large and rather prominent ; the eyelid should be fine and thin. This thinness is for the purpose of preventing pressure, and at the same time to give more extensive and easy motion.

The horse is devoid of eyebrows, and the eyelashes are singularly arranged. The rows of hairs are longest and most numerous on the upper lid, and especially towards the outer or temporal corner, because the light falls on the eye from above ; and as he stands, especially when he is grazing, as well as from the lateral situation of the eyes, the greater portion of the light, the attacks of insects, and the trickling down of moisture, is chiefly from the outside. Towards the inner corner of the eye there are hardly any eyelashes, because there is little or no danger from below, and as little light is thrown from below, the eyelashes are thin and short. While horses are grazing, insects may find their way to the eye towards the inner angle, the principal or only hair is found on the lower lid. All of which most

beautifully proves design in the formation and adaptation of the animal. The eyelashes should on no account whatever be cut, as they have a most important office to fill, not only preventing the eye from being injured by dazzling light, but also protecting it from the intrusion of insects.

The horse is destitute of eyebrows, but in their stead he is provided with a number of scattered bristly hairs, as also a projecting fold of the upper eyelid, which answers the same purpose. Some persons are so foolish as to cut off these hairs, and have absurdly attributed them to weakness. The under eyelid also is furnished with projecting bristly hairs, which are so sensitive that they give immediate warning to the animal of the approach of any insect or other object which might injure the eye, and he naturally closes the eyelid instantaneously. Ignorant grooms sometimes denude horses of these admirable premonitory feelers. The power of this muscle is so great, that it has been ascertained to exert a force equal to twenty pounds, and in consequence the operation for cataract is rendered nearly impossible. It will thus be seen that these muscles are admirable substitutes for the want of hands, in protecting the eyes against the intrusion of things that would injure them. They are also partially separated into four divisions, and by this means assist the straight muscles in turning the eye.

These muscles perform another important office in altering the focus of the eye to accommode itself to the examination of distant or near objects. (See *c* and *b*, fig. 5.) The straight and retractor muscles draw back the eye, and forces it upon the substance, and thus in a slight degree flattens it, brings it nearer the retina or mirror, and adapts the eye to the observation of distant objects.

But as these muscles are chiefly employed in supporting

the weight of the eye, they might not have power to turn it so quickly and to such an extent as the animal might wish or require ; therefore the eye is furnished with two other muscles, whose entire office is to turn it. They are placed obliquely, and in consequence are called the oblique muscles. The upper one, *a b*, is curiously constructed. It emanates from the back part of the orbit, and follows a direction upwards, and towards the inner side, and there, immediately under the ridge of the orbit, it passes through a perfect mechanical pulley, and turning round takes a direction across the eye, and is inserted a little beyond the middle of the eye, and towards the outer side. Thus the globe of the eye is evidently directed inward and upward. This is not all which is accomplished by this remarkable mechanism. That the eye may be completely defended, it is sunk deep in the orbit, but it may be occasionally requisite to bring the eye forward and enlarge the field of vision. Under the influence of fear the eye is positively protruded, and it is not only forced more forward, but the lids are opened more widely. It may be asked, how can this be possibly accomplished ? The remarkable pulley-muscle, or *trochlearis*, at *b c*, readily effects this, while the straight muscles at the same time do not oppose it, or only regulate the direction of the eye, it is really brought forward. The lower oblique muscle has its insertion just within the lachrymal-bone, *n*, and proceeding across the eye is fixed into part of the *sclerotica*, opposite to the other oblique muscle, and turns the eye in an opposite direction, and also assisting the upper oblique muscle in bringing the eye forward from its socket.

There is another beautiful provision preventing impurities or insects from being carried to and lodging in the corner of the eye, which would, if allowed to accumulate at the

inner angle of the eye, be carried down the duct, which would irritate and obstruct it. No sooner do any of these annoyances enter the eye but they are carried off by the haw, which lies concealed within the inner corner of the eye. This haw is a black or pied cartilaginous substance of a triangular form, concave within and made exactly to suit the globe of the eye ; while it is convex externally, accurately fitting the membrane lining the lid, while the base of it is reduced to a thin or almost sharp edge. The horse has the voluntary power of suddenly protruding this from its concealment, and passing it rapidly over the eyeball, clears off every nuisance mixed with the tears, and then being quickly drawn back, the dust or insect is wiped off as the cartilage again passes under the corner of the eye.

In treating of disease of the haw, page 44, we mentioned the barbarous practice of cutting out this valuable appendage to the eye. This member is destined by nature as a substitute for the want of hands for wiping the eye and cleansing it from offensive matter. This being removed, subjects the poor animal to pain in its eye for life, and lays it open to the constant chance of inflammation from dust or small pieces of gravel being blown into it. The pain they thus inflict on the horse may be easily conceived by any one having dust or other extraneous matter lodged between the eyelid and eye, and being without hands to wipe it out.

THE EYE AND ITS VISUAL STRUCTURE.

PLATE X. FIG. 8.

The eye is of a spherical figure, yet not perfectly globular ; or it may rather be considered as composed of the parts of

two globes, the half of the one, A, plate x. fig. 8, smaller, and transparent in front; and of the other, B, which is larger, with an opaque coat behind.

It is an established law in optics, that all objects become visible from the rays of light which flow from these objects into the eye. These rays pass through the pupil and fall upon the retina, which is a fine expansion of the optic nerve, interwoven like net-work in the back part or bottom of the eye, and there the rays form a picture of the object, whose apparent bulk depends upon the size of such picture so formed upon the retina. We shall suppose the animal looking at an arrow with the barb of it downwards, *c*, *d*. From every part of the arrow rays of light will be sent forth in straight lines, and in passing through the pupil, plate iii. fig. 5, *k*, it is clear that those which flow from the under portion of the object, *c*, must flow upwards, while those above, *d*, must pass downwards; and pursuing this principle, all the intermediate rays, *f*, will intervene, consequently a reversed picture of the object will be formed upon the retina, as seen at *g*, *h*.

Paley makes the following interesting observation on this subject: he says, "In considering vision as achieved by means of an image formed at the bottom of the eye, we can never reflect without wonder on the smallness, yet correctness of the picture, the subtlety of the touch, and the fineness of the lines. A landscape of five or six square leagues is brought into a space of half-an-inch in diameter; yet the magnitude of objects which it contains are all preserved, are all discriminated in their magnitudes, positions, figures, and colours. A stage-coach passing at its ordinary speed for several minutes, passes in the eye only over one twelfth of an inch, yet is the change of place in the image distinctly perceived throughout its whole progress."

- i, i.* The points where the rays, having passed the cornea, converge by the refracting power of the lens.
- j.* The cornea, or horny and transparent portion, which is covered by the conjunctiva uniting different parts together.

The cornea fills up the vacuity which is left by the sclerotica; but although it is closely united with it, may be easily separated and will drop out. A prominent eye adds greatly to the beauty of a horse, and this will depend upon the projection of the cornea. But if too prominent, the rays of light may be rendered too convergent, which will reduce indistinct vision. If it be small and flat, the rays may not be sufficiently convergent, which will produce imperfect vision. An eye that is moderately convex will be found best; because, when either too prominent or too flat, the horse is liable to starting and shying upon a road. The cornea is quite transparent in the healthy eye, and when cloudiness is observable, then it is an indication of disease.

In the purchase of a horse, the utmost attention should be given to the condition of the cornea. Perfect transparency over the whole surface is indispensable. The eye should be carefully examined in the manner pointed out at page 47; first in front, and afterwards through its substance.

- k, k.* The crystalline, or glassy lens, situated behind the pupil and in front of the vitreous humour, which is so named from a supposed resemblance to melted glass; it is a clear gelatinous fluid, very much resembling the white of an egg.
- l.* The sclerotica, a hard firm coating, covering the whole of the eye, except that portion occupied by the cornea, and being a seeming prolongation of the covering of the optic-nerve, *l, l.* The choroides, or choroid coat, covered with a black secretion, or black or dark brown paint, called the pigmentum nigrum.

This delicate membrane extends over the whole internal

part of the eye, from the optic-nerve to the cornea. This is intended to absorb the stray rays of light which might dazzle and confuse the animal, and is not found on any portion which may be called the field of vision ; but in its stead a bright green substance is spread, which extends more over the upper than the lower portion, because the objects which are most necessary for him to see are below the level of the head. This in some way, yet undiscovered, enables the animal to see even when it is comparatively dark. In the dusk this beautiful sea-green colour may be seen in the eye of a horse.

Cream-coloured, or perfectly white horses, have not this dark pigment ; so that the ordinary appearance of the pupil is red instead of black. In looking into their eyes we do not see the covering, but the choroid coat itself.

m, m. The iris, or rainbow-coloured circular membrane, situated under the cornea in front of the eye, and on which the colour of the eye depends. The duplicature behind is the uvea, so called from its colour resembling a grape. See also plate iii. fig. 5, *i.* The iris acts as a curtain, and floats in the aqueous humour.

In horses the colour of the iris is subject to little variation, but for the most part has some analogy with that of the hide, varying in different degrees from hazel to dark brown.

n. The pupil is placed in the centre of the cornea, and through which all the rays of objects pass to the retina or mirror of the eye. See also plate iii. fig. 5, *k.*

In the horse it is of an oblong form, (see plate iii. fig. 4.) It is variable in size, depending upon the intensity of the light in which it is viewed. In the open air it will be much contracted, so as to prevent too large a quantity of light being thrown upon the retina, as it is painful and injurious to that object to receive too great a portion of it, as well as pre-

judicial to vision ; while in a dark stable it expands, in consequence of a deficient portion of light reaching the retina.

This contraction and expansion of the pupil is of much service in enabling purchasers to judge of the state of the horse's sight. There is a description of blindness, in which the crystalline lens and cornea continue quite transparent, but the retina of the eye is palsied, and consequently not affected by light ; so that the pupils are hardly if at all altered by a change from light to darkness, or *vice versâ*. In purchasing a horse, the size of both pupils should be strictly observed, to see that they both expand and contract to the same extent by the change of light. The hand ought to be held over the eyes for a short time, and then notice if both pupils expand alike, when removed.

Suspended from the upper edge of the pupil of the eye two or three black bodies may be discovered on close inspection, the size of millet-seeds. When the horse is suddenly brought into an intense light, the pupil suddenly contracts ; these little globes are pressed out from between the edges of the iris, and an equal number, but of much smaller size, are attached to the lower edge of the iris. Their use probably is to intercept portions of light which would be injurious to the eye. But their chief function is called into action while grazing, and perform the duties which are attributed to the eyelashes, namely, to obstruct the rays of light in those directions in which it would come with the greatest force both from above and below ; while at the same time the field of view is quite open, so far as respects the pasture on which the horse is grazing.

o, o. The ciliary, or hair-like processes.

p. The vitreous, or glass-like humour, which fills the whole of the cavity of the eye behind the lens. It is a clear

gelatinous fluid, resembling the white of an egg. It fills about three-fourths of the globe of the eye, and extends from the posterior part as far forward as the ciliary ligament.

- q.* The aqueous, or water-like humour which fills the space between the cornea and the crystalline lens.

It is by means of this humour that the cornea is preserved in its rounded form. A small portion of it is behind the iris.

- r.* The retina, or fine net-like expansion of the optic-nerve, which is spread over the whole of the choroides, as far as the lens.
- s.* The optic-nerve, or nerve of sight.
- t.* The conjunctiva, or that membrane which covers the front part of the eye, and which lines the lids, and even extends to the transparent portion of it. It is transparent, and transmits colour to the parts beneath. It is very liable to inflammation, during which the vessels of the lining of the lids will become gorged with blood, and present an intensely red appearance, which extends itself to those vessels in the white of the eye, which will also become completely covered with blood, and will ultimately render the cornea clouded and opaque. This membrane is the seat of almost all the diseases of the eye; many of which too frequently terminate in total blindness.

A defect of sight in the horse is more dangerous than total blindness, for this reason, that one with a defect of sight will start and shy at every object which he meets with upon a road, and the rider may be thrown off when he least expects it; while a horse that is quite blind will generally resign himself to the guidance of his rider or driver.

THE TEETH AND THEIR DEVELOPMENT.

Mastication in the horse is performed in two ways, namely, by a champing motion, and also a grinding motion.

At *o*, plate iii. fig. 1, is the masseter-muscle, which is of

great strength, and constituting the cheek ; it has its origin at the superior maxillary bone, under the ridge continued from the zygomatic-arch, plate viii. fig. 3, *f, f*, and inserted into the lower jaw. This acts in conjunction with the temporal muscle in closing the jaw, and in producing its direct cutting, or champing motion.

Inside of the lower jaw, on each side, and occupying the entire of the hollowed portion, and opposite the masseter, or cheek-muscles, are the pterygoid-muscles, which proceed from the jaw-bones to those more in the centre of the channel, also shutting the mouth, and likewise by their alternate action giving that grinding motion so necessary in preparing the food of the horse.

The channel which occupies that portion of the lower jaw between the branches, is of considerable importance in the conformation of the head of the horse. If this part is too wide, it always gives a clumsy, heavy appearance to the face ; and when too narrow, it prevents the animal from bending his head with freedom and grace. Horses with such heads are unpleasant in the hand either of the rider or driver, as they constantly keep pulling and stretching their head, which also prevents them from being well reined in.

The changes which successively take place in the incisory teeth throughout the whole period of the life, form the most certain test of the age of the horse.

The teeth of a horse are forty in number, and in the mare thirty-six, being destitute of the four canines. The incisory, or cutting teeth, are temporary, and are replaced by others from two and a half years, to four or five. The marks on them which distinguish the age become obliterated at eight years. The life of a horse may be divided into three periods ; first, from birth to two and a half years,

which is distinguished by the first appearance of the incisory teeth, and by the wearing out of their external cavity. We have then the one characterized by the wear of the dental funnel. During this period the table of the incisor teeth contains in its middle the central enamel, and the funnel at first traverses from one side to the other, and becomes successively triangular, oval, and round. In the third period, the wear of the portion of the tooth next the root indicates it. After the central enamel becomes obliterated, the table shows a coloured point, which disappears before the wear of the funnel is completed, and takes different shades of colour as well as shapes; and in very old teeth the root is superseded by a small black cavity.

In the early stages of their formation, the incisor teeth of the horse resemble a cellular body whose sides are soft and membraneous, and quickly become hard and thickened, and are then reflected at the side of the table. From this primary dental production emanate two cavities that have no communication with each other, and which are essentially different, the largest being situated next the root. (See plate v. fig. 11.) This contains the pulpy substance. The other cavity is open at the side next the table, and forms a reflected funnel. This dental production is soon transformed into enamel, which is quickly surrounded with the bony substance on both its surfaces; the latter incrusts itself in greater quantity on the side next the root, but never completely fills the funnel, the cavity of which is never obliterated except through the effect of wear. This funnel, as has just been mentioned, is formed by the reflection of the elementary membrane of the tooth, and forms a true partition, acquiring a certain length, and terminating in a rounded blind pouch.

Through wear, the enamel of the incisors is divided

12. *Lawsonia or yellow* *leaf*
by *W. H. H.*
13. *Scandian or Malabar*

into two portions, the exterior or casing enamel, and the other, the interior, which envelopes the funnel. The enamel being harder, and offering more resistance than the bony substance that surrounds it on all sides, the central enamel presents a slight prominence, and takes on different forms in proportion as the funnel becomes destroyed and contracted.

As we have stated, the horse has forty teeth ; namely; six incisor, or cutting teeth, in both jaws, (see plate iii. fig. 2, *b, b*;) two tushes, or canines, in each jaw, *a, a*; and ~~six~~ ¹² molars, or grinders, in both jaws, *h, h*. There is a considerable vacant space between the incisors and tushes, as also between the tushes and grinders, as will be seen by the figure referred to. These teeth are inserted into sockets, consisting of a spongy, bony substance, called the alveolar process, which forms the edge of the maxillary bones. All the teeth are first germinated in the interior of the maxillary bones ; and having acquired a certain size, and the exterior table of their sockets having been dissipated by absorption, they push out above the gums. Those which appear shortly after birth are called sucking, or temporary teeth ; these consist of incisors and the three first grinders. The formation and appearance of the others are later, and are called the permanent teeth ; and those which succeed the temporary are called the replacers, or horse-teeth.

DENTAL INDICATIONS OF THE AGE OF A HORSE.

Nothing can more clearly indicate a proof of design than the beautiful contrivance in the formation of the grinders of the horse for the purposes required. They are, like the cutting teeth, covered on the sides with enamel, but not on the top, though several portions of enamel enter into their substance in their internal structure. They are subjected

to much more friction than the cutting teeth in grinding down the harder portions of their food, and nature has made ample provision for their strength and endurance.

We have given a representation of the section of a grinder (plate v. fig. 12) to show its interior structure. The teeth are prepared and formed in cavities within the jaw-bones. In the unborn animal a delicate membranous bag, containing a jelly-like substance, is situate in the small cell within the jaw-bone. By degrees this substance assumes the form of a tooth, and then the jelly within the membrane begins to change to a bony consistence ; then a hard crystallization is formed on the outside of this membranous covering. This is the enamel of the tooth. In the formation of each grinder of the horse in the upper jaw, there are originally five of these membranous bags filled with jelly, and four in the lower jaw. This jelly is gradually superseded by bony matter, which is deposited by little vessels penetrating into it. These vessels are represented by the black streaks in the darker central portions of the figure, around each of which the crystallization of enamel can be distinctly traced, so that there would be five distinct bones or teeth. The white spates in the figure represent a very powerful cement, which unites all these distinct bones into one compact body, thus making one tooth of the five as they originally appeared to be ; this being accomplished, an outer coating of enamel invests the whole of the sides, but not the top, which completes the tooth. It will thus be manifest that this is a beautiful and perfect contrivance to prevent the wearing down of the grinders by the constant friction to which they are subjected by chewing the harder portions of their food. Thus it will be seen there are columns of enamel penetrating through the entire substance of the tooth ; this, together with the bony matter and cement by

which the different layers are united, and which fill the spaces between the columns, soon begin to wear away, while the enamel remains, thus occasioning the uneven surface presented by them, and which is the very best structure for them to possess in order to grind down the food.

The grinders in the lower jaw, as we have above observed, having been only provided with four of those bags, are consequently smaller and narrower, and more regular in their form than the upper ones. They are placed horizontally in both jaws ; but in the lower one the higher side is within, and gradually shelving outwards, while in the upper jaw the higher side is without, and shelving inwards ; by which beautiful arrangement the triturating or grinding motion is most advantageously performed. Each of the grinders is different in structure and appearance, and can be respectively recognised with the situation of, and the jaws to which they belonged.

When the foal is born, it has the first and second grinders, which are large compared with the size of those by which they are afterwards replaced. In six or eight days after birth, the centre nippers make their appearance. These are large in comparison to the size of the jaw, and occupy its whole front, as represented in plate iv. fig. 1. In three weeks or a month the third grinders will have made their appearance, and within six weeks an additional incisor on each side of the two first, both above and below, will be visible, and soon after completed, and the jaw will have assumed the form exhibited in fig. 2. The two molars that the foal has at birth remain until the animal is two and a half years of age, at which time they are forced out of their sockets by the protrusion of the second set, or replacers. But from this time there is no use in consulting the grinders for the age of the horse, as the best tests and

easiest come at are the incisors. The supplementary molars appear in the following order : the first, at about ten or eleven months ; the second, about twenty months ; and the third, from four to six years of age.

The incisor teeth are continually undergoing some change, in consequence of the friction produced by the action of their rubbing against each other. The anterior edge being considerably more elevated and sharper than the posterior, the wear first commences there, and in a short time it is level with the posterior, then both wear together ; the longitudinal cavity becomes narrower, and afterwards triangular, and, finally, at a certain period disappears, and is replaced by the small end of the funnel next the root ; it is this regular wear which is termed "losing the mark," (see fig. 4.) The obliteration of the mark has frequently taken place by the time the corner teeth are beginning to appear. It must be distinctly understood, that in speaking of the marks in the tooth we constantly refer to the incisors of the under jaw, except when otherwise expressed ; and the ages of all horses are reckoned from May.

When an incisor tooth has commenced wearing, and its two edges are parallel, the table exhibits two bands of enamel, the one exterior, that surrounds the tooth, which is termed the *casing* enamel ; the other internal, only surrounding the cavity, and this is called the *central* enamel, (see plate iv. figs. 3 and 5.) The incisor teeth of the lower jaw always wear more quickly than those of the upper, and uniformly more regular. The reason of this has never been satisfactorily accounted for, but it is certainly very remarkable. From this fact it is obvious that it is more difficult to judge of the period of obliteration of the mark in the upper jaw. In the lower jaw the marks of the nippers, or central incisors, are always obliterated at ten months ; in

the dividers or second teeth at one year, and from the corner or inner incisors varying from fifteen months to two years.

By this time the marks of the upper nippers have become almost entirely obliterated, so that at two years old the cavities in all the teeth have disappeared, as well of the lower as of the upper jaw.

At this period the crowns of the nippers become insensibly smaller, and with their base necked. They also assume a yellowish-brown aspect, soon after which they loosen and almost entirely lose their attachment in the gums, and finally fall out. It is at this time the second period in the age of a horse commences.

The *mark* in the tooth is occasioned by the food blackening the hollow pit which is formed on their surface by the bending in of the enamel, which passes over the surface of the teeth; and by the gradual wearing down of the enamel from friction, and the consequent disappearance of it, we are enabled for several years to judge of the age of the animal.

In the third year, the tushes sometimes begin to make their appearance, although there are instances of their not being developed until the fifth or sixth year. But the most general time for their appearing is in the fourth year. Little dependence can, therefore, be placed on them in determining the age of the horse. We have given a representation of a three-year-old mouth, (fig. 5,) in which it will be seen the central teeth are larger than the others, and are provided with two grooves in the outer convex surface. The mark is long, narrow, deep, and black; and these teeth, not having attained their full growth, are somewhat lower than the others. In the two next teeth the mark is nearly worn out, and in the corner teeth it is slowly disappearing.

At this period it is not unusual for dishonest dealers to deceive the unskilful with regard to the age of a horse. If they happen to possess one that has been foaled a little earlier than usual, probably in January, and which may have acquired bulk and strength, they punch or draw out the central nippers, and the others appear some months earlier than they otherwise would. This will allow the teeth to rise much quicker than they would do naturally, and three or four months may be thereby gained in their reproduction; consequently dealers who wish to take advantage of this may sell a colt for a year older than he actually is.

But we must look to the general form of the animal, and when young it will be manifested by the small development of the forehead. The second pair of incisors will still have the mark, and it will also be much stronger on the corner ones, and probably with an enlargement or irregularity about the gums, in consequence of the teeth having been violently forced out; the first and fifth grinders will be small, and the sixth will not have yet appeared. As it is the teeth of the lower jaw which are usually consulted as to his age, dealers who wish thus to impose seldom extract the teeth of the upper jaw, therefore it would be well to examine it also, when all the signs will remain. Attention to these points will enable any one to detect the true age of the colt.

A horse at three years of age will have the central permanent nippers growing with their edges sharp in comparison to the others. All the others will be in a state of decay, and he will have ⁴~~2~~ grinders in both jaws on each side, the first and ~~sixth~~ ^{3 4 5 6} of which will be level with the others, and the ~~sixth~~ ^{3 4 5 6} protruding.

At three years and a half, or at least between that and

four, the central pair of incisors will be nearly perfect, and the second pair will have been shed, and a vacant space left where they were inserted ; the corner ones will have become narrower, and their surface considerably worn down, with the mark small and indistinct. The ^{3rd + 6th} second pair of grinders fall at this time. *+ the Perms are up at 4 or from that to*

At four years the central incisors will have attained their full size, and the sharp edge which always accompanies the teeth while growing will now be considerably worn off. The mark becomes shorter and wider, and more faint, (see fig. 6.) The second pair will be grown, but still a little smaller, with the mark very deep, and extending entirely across the surface. The corner nippers will be somewhat larger than the inside ones, although a little smaller than they were, and with their surface flat and the mark nearly obliterated ; the sixth grinder will have grown level with the others, and the tushes considerably developed. The mouth will be still shallow, the fore hand of the animal will still be low, and with a considerable degree of legginess, which are additional indications of the age of the horse.

The last important change takes place in the mouth of the horse between four years and a half to five years. The corner incisors are shed, and the permanent ones make their appearance ; the central ones are considerably worn, and the next pair are beginning to exhibit marks of wear. The tushes are now fully half an inch above the gums, with an external rounded prominence, and a groove on each side. Up to the period of the reproduction of the corner incisor the animal is designated a colt, but it now assumes the name of horse ; the female, which up to this time has been denominated filley, is now called mare.

The mouth of the horse is nearly perfect at the age of five years. The corner incisors are fully developed, with

the mark on the inside long and irregular. (See plate iv. fig. 7.) The other nippers will exhibit considerable indications of wearing, the tushes be much grown, and the grooves on the sides will have nearly or quite disappeared, presenting an almost regular convex surface. They are still, however, as concave within, and with their edges nearly as sharp as they were six months previously. The sixth molar tooth will have attained its complete height, and the third molar will be wanting. This last sign can never be mistaken, and if a dealer has removed it, such is the force required to displace it, that evident marks of violence will remain. The three last grinders and tushes are never shed.

When the animal has attained its sixth year, the mark on the central incisors, or nippers, will be completely worn off, leaving, however, a little difference of colour in the centre of the teeth. The cement which fills the hole produced by the dipping in of the enamel will be somewhat browner than that of other portions of the tooth, and will exhibit evident proofs of the edge being surrounded by enamel. This condition has perplexed the inexperienced, as many expect to find the surface of the tooth plain, and of a uniform colour, whereas they are both irregular and discoloured, as we have above described, (see plate iv. fig. 8.)

In the second incisors the mark is shorter, broader, and more faint, with the enamel of the edges of the corner teeth more regular, while the surface gives sufficient evidence of wear. The tushes will have attained their full size, being fully an inch long, convex outwardly, and a little concave inwardly, acuminate towards the point, and slightly incurved at the apex. The third grinder will be fully up, and all of them presenting a level surface ; so that the mouth is now perfect.

During the long period which the horse is subjected to teething, it is surprising how little the animal has suffered from it, and hardly a day of his valuable services will have been lost. In some instances heat and swelling of the gums take place, but this can easily be removed by scarification. Here then we have an example of the wisdom and perfection of the works of creation; were the horse to suffer as much as the human being, he would not be able to chew his food for weeks, and must consequently fall off in flesh. Dogs are liable to convulsions while cutting their teeth, and many even die during this process.

At seven years the marks in the four centre incisors are worn out, and are speedily disappearing in the corner ones. The tushes are now undergoing an alteration of form; they are rounded at the point and edges, but still inflated outwardly, and beginning to round inwardly; the inner edge of the corner teeth is on a level with the outer, in consequence of wear. Sometimes a notch is observable in the upper corner teeth. (See plate v. fig. 1.)

At eight years old all the marks on the teeth of the lower jaw will be obliterated, and will be on a level at the surface; their form is changed, they assume an oval shape, and the cavity is altered into an elongated transverse protrusion of enamel, which is the termination of the central enamel, or funnel next the root. (Plate v. fig. 2.) After this period it is the practice to examine the nippers of the upper jaw, and to draw deductions as to the age of the horse; because, for years after the marks have become obliterated in the lower jaw, traces of them exist in the upper jaw. This is in consequence of the enamel which occupies the pit in the centre of the tooth not being elevated to a level with the general surface, so that there is a greater depth to be worn down in order to rub it off; and besides, the

upper incisors are less liable to friction and wear than those of the under jaw, in consequence of the lower jaw alone being moved in the act of chewing, and the upper jaw being fixed and without motion : its office is only to resist the pressure of the under jaw in eating.

The tushes are of no use whatever in enabling us to determine the age of a horse, because the change of their form is very uncertain. They will sometimes be blunt at one year, and in other cases will remain pointed to eighteen or even twenty. They do not rub against each other like the teeth, and are consequently less liable to be worn down.

After eight, we are best enabled to judge of the age of a horse from the form of the upper surface of the incisors. At this time all of them are transversely oval, that is, the length of the oval extended from one tooth to another. As the animal advances in years, they diminish in size, the width being the first affected, and not their thickness. They soon grow a little apart from each other, and their surface rounded, which continues to be the case up to thirteen years ; after this they assume a new character, and become triangular in the same order in which they had become oval and rounded.

At nine, the nippers or middle incisors are rounded, and the next teeth or dividers begin to assume that form ; the remainder of the funnel of these four teeth is round, and quite close to the inner edge of the tooth ; they also exhibit the septum of the root.

At ten, the incisors will be considerably shortened in their oval form. There is merely a rudiment of the funnel of the nippers, as well as in the dividers, and the remainder of the central enamel touches the inner edge of the table of the tooth. The nippers and dividers are rounded, and the corner teeth exhibit an oval form. (Plate v. fig. 3.)

When the horse has attained its eleventh year, the second pair of nippers are quite rounded, and the central enamel is hardly any longer apparent in the teeth of the lower jaw.

The corner teeth at twelve are rounded, and the central enamel has completely disappeared; the yellowish band is of greater extent, and occupies the centre of the wearing surface. In the upper jaw, however, the central enamel still remains. (See plate v. fig. 4.)

At thirteen years of age the lower incisors are rounded, the sides of the nippers are getting elongated, the central enamel continues in the teeth of the upper jaw, but it is round and approaching to the posterior edge. The septum at the root is rounded in the dividers, and is seen in the middle of the table. The tushes are now generally much worn.

The lower nippers present a triangular appearance at fourteen, the dividers are becoming long at the sides, the central enamel of the upper teeth diminishes, but still remains. The tushes are considerably more worn than in the preceding year. (Plate v. fig. 5.)

At fifteen, the nippers are triangular, the dividers are becoming so; the central enamel of the upper teeth has not yet disappeared. The septum of the roots forms a rounded point on all the tables of the teeth.

The dividers are triangular at sixteen, the corner teeth are beginning to become so; the central enamel in the upper teeth will in most instances have quite disappeared, the nippers are beginning to be flattened at their sides. The tushes are now considerably more worn than in the preceding year.

When the horse has reached its seventeenth year, the teeth of the lower jaw have become completely triangular,

but the sides of the triangles are all of one length. (See plate v. fig. 6.)

At eighteen years, the lateral portions of the triangle lengthen in succession. First the nippers, then the dividers, and afterwards the corner teeth.

At nineteen, the angles begin to wear off, the central teeth are again oval, but in a reverse direction, that is, from forward, inward, and the lower nippers are flattened from one side to the other.

This triangular form is not very much developed in the beginning, the edges being slightly rounded, and the three sides are very nearly equal in length; afterwards, the lateral portions grow longer, whilst the anterior or outer side appears to diminish, the extremities become angular; and this lengthening in a short time is so great, that at from nineteen to twenty years of age the incisors have in reality become flattened from one side to the other. This flattening proceeds in succession from the nippers to the dividers, and from them to the corner teeth, in such a way as to enable us to distinguish the age of the horse up to twenty-two to twenty-three years.

At twenty, the dividers are of the same shape, and at twenty-one, the whole teeth have acquired this form.

After this period the incisors do not exhibit any particular characters whereby to guide us in determining the age of a horse. They gradually become more flattened, converging towards each other, and touching merely by their lateral and anterior edge. Gradually they become dried, and the gums whitened, the tables of the teeth assume a greyish cast, the incisors in their whole extent are frequently incrustated at their base by a thick coating of tartar. The jaw-bones also become narrow.

In consequence of the continual growing up of the teeth

of the bone from the side next the root, and the socket not being sufficiently long, the pressure of the new portion of the root gives the tooth an outward inclination. Besides, these new portions of the teeth being always narrower, the sockets must necessarily contract, in order to secure the teeth. At this time the sides of the superior maxillaries become flattened, and the head assumes a lengthened and pointed form, which gives to the animal an appearance, which is very indicative of age. The horizontal direction, owing to the same cause, is always a mark of advanced life; but this direction is much developed in some horses, and not at all in others, the cause of which remains still a question.

The horizontal direction of the teeth, which increases with the years of a horse, will be easily understood by a reference to plate v. fig. 18. This figure represents the under incisor teeth of a horse known by the name of "Old Billy," which attained his SEVENTY-SIXTH year, and was perhaps the oldest horse that ever lived. The cranium, with the muscles preserved, is deposited in the Museum of the Manchester Natural History Society, from which I made the drawing. The whole of the incisors are much elongated horizontally, but not perpendicularly elevated more than those of a horse at six years of age. The upper surface of the nippers and dividers are of a quadrangular form, the inner margins being a little rounded; while the corner teeth are oblong oval, nearly the form of an egg, with the most acute end outwards. The tushes are conical, a little blunted on the crown, and turned backward, with an elongated, shallow, curved groove on their inner sides. I will be seen that the outer edge of all the cutting teeth is nearly parallel, the corner teeth being only a little less produced than the others. It does not appear that the jaw-bones themselves have been lengthened, the teeth alone

having shot forward ; consequently their surface is lying obliquely, and hence their elongated form from front to back, as more particularly developed in the corner teeth. The tushes are considerably larger in proportion than in a horse under twenty years of age.

We may briefly remark that the incisory teeth of the horse remain as guides to mark throughout the whole of life his age, and indicate the successive degrees up from twenty-one to twenty-three years : first, by the order in which they appear ; second, by the obliteration of their outer cavity ; third, by the changes and disappearance of their funnel ; and fourthly and lastly, by the successive shapes assumed by their table after nine years of age, and which are the oval, the rounded, the triangular, and the biangular. The appearance of the incisors, and the obliteration of their mark, are unquestionably the most certain indications by which to judge of the age of a horse. During the four or five years that follow the obliteration of the mark, the knowledge of the age is still tolerably certain, because there are many modes of correcting it ; such as the condition of the termination of the blind pouch of the funnel next the root, the general appearance of the tooth, and the form that the table of the tooth assumes. The periods of triangularity and biangularity present the greatest difficulties ; the data of these latter periods are most commonly approximations ; nay, it is next to impossible to pronounce a *positive opinion* as to the age of a horse from seventeen to twenty.

That the reader may more easily comprehend and consult the data for judging of the age of a horse, we have given the following table, which affords a comprehensive view of all the periods which we have more fully detailed in the preceding remarks, a reference to each being noted at the end of the table.

TABLE EXHIBITING THE DENTAL INDICATIONS OF THE AGE OF A HORSE

FROM FIVE TO TWENTY-TWO YEARS.

AGE.	NIPPERS.	DIVIDERS.	CORNER TEETH.	OBSERVATIONS.	PAGE.
5	Mark more or less lost.....	On a level with the nippers, and its inner on a level with its outer edge.	Lower than the dividers, nick in the inner edge, which is not on a level with the outer.	Teeth quite fresh, the area of the dental region forming a regular semi-circle.....	219
6	Mark lost, end of outer blind pouch slightly concave in the middle.	Mark	On a level with the dividers, outer edge a little worn.	Centre with a slight yellowish tinge of colour.....	220
7	Central enamel triangular.....	Mark lost, central enamel concave in the middle.....	Inner edge on a level with the outer; beginning to lose the mark.	Same mouth, with nick in upper corner.....	221
8	Oval, central enamel rounded, and very near the inner edge.	Oval, central enamel triangular..	Mark lost, central enamel concave in the middle.	Appearance of, and of blind pouch of inner cavity, in the form of a small, yellowish, or greyish band, longest transversely, and situate between the centre enamel and the inner edge of the tooth.	221
9	Rounded, central enamel round, and very near the inner edge.	Oval, central enamel rounded, and approaching the inner edge.	Oval, central, enamel round and still nearer the inner edge.		222
10	Rounded, central enamel round, and still nearer the inner edge.	Rounded, central enamel as in the nippers.	Rounded, central enamel as in the nippers and dividers.		222
11	Rounded, central enamel gone, or only forming a small round speck close to the inner edge.	Rounded, central enamel quite gone.	Rounded, central enamel quite gone.		223
12	Rounded, central enamel quite gone.	Rounded	Rounded	Yellowish band of greater extent.	223
13	Rounded	Rounded	Rounded	Sides of nippers a little elongated, septum at the root of dividers rounded	223
14	Triangular	Rounded	Rounded	Dividers becoming long	223
15	Triangular	Triangular.....	Rounded	Central enamel of upper teeth not quite gone.....	223
16	Triangular.....	Triangular.....	Triangular.....	Corner teeth becoming triangular.	223
17	Triangular.....	Triangular.....	Triangular.....	Sides of triangle all of one length.	223
18	Triangular.....	Triangular.....	Triangular.....	Lateral portions lengthen in succession.....	224
19	Flattened from side to side.....	Triangular.....	Triangular.....	Dividers becoming oval.....	224
20	Flattened from side to side.....	Flattened from side to side.....	Triangular.....	All the incisors converge towards each other.	224
21	Flattened from side to side.....	Flattened from side to side.....	Flattened from side to side.....		
22	Flattened from side to side.....	Flattened from side to side.....	Flattened from side to side.....	All with an outward inclination..	224

The portion of the tooth which is buried in the gums is called "the root;" the nippers are placed parallel to the axis of the jaw, that is, perpendicular to it; the dividers are somewhat oblique, and the corner teeth still more so, with their roots turning inwards; the semicircle formed by the roots of these teeth is considerably narrower, and occupies less space than that of the free portion.

The length, shape, and proportions of the roots change according to the different degrees of age, and present some variations, which it is necessary to describe. During the time of the protrusion of the tooth, the root is generally round, short, and quite hollow; its internal cavity, the sides of which are very thin, is only of temporary duration, and does not present, like the external cavity, a sort of funnel, which is peculiar to the latter. It buries itself deeply, is prolonged externally, surrounds the outer funnel, and contains a pulpy substance that appears to be the central germ of vitality and nourishment to the tooth. According as the animal advances in age, a progressive diminution of this cavity takes place, commencing at the bottom, and beginning towards the inner edge of the tooth; it is collected from the side next the root. The latter lengthens, continues constantly to grow, and the fresh portions, instead of being rounded, are at first triangular, and then flattened from side to side; and lastly, at a period that varies in some horses according to the teeth, the cavity disappears altogether; the root is then pointed at its termination, and entirely ceases to grow.

The entire length of the temporary incisors varies from an inch and a quarter to an inch and three quarters; and the permanent incisors from two inches and a half to three and a quarter. Their form is not the same throughout. Thus, next to the surface of wear, they become flattened from front to rear, they narrow towards the edge of the

socket, are at first oval and then rounded, and of a triangular form towards the base of the root, with the extremity flattened from side to side. This variation is much more remarkable in the nippers and dividers than in the corner teeth, which is rendered more obvious by making several sections of an incisor tooth at somewhat about a quarter of an inch apart. We have given five transverse sections of the tooth of a young horse to exhibit this: plate v. figs. 13, 14, 15, 16, and 17, have the funnel, and the sections, 16 and 17, show the septum of the root of the tooth.

The incisors of the upper jaw are stronger, broader, and more developed than those of the lower; consequently the outer edge of the lower corner teeth rest against the centre of the upper corners, and wears them in such a manner as to produce in some jaws a triangular nick, which leads in a certain degree to the determination of the age of a horse. This nick never appears until the horse has attained its seventh year. It becomes obliterated in time, but sooner in proportion as the jaw assumes a horizontal direction.

We have given representations of six teeth, showing the exterior of the incisor teeth, together with their internal organization.

The tooth of a foal viewed from its posterior or inner surface. Plate v. fig. 8, *a*, the mouth of the cavity of funnel of the table.

Another foal's tooth, viewed anteriorly, fig. 7: *a*, exhibits the body of the tooth; *b*, the neck; and *c*, the root.

The tooth of a very young foal, in which the casing or outer enamel is cut through its whole length, and exhibiting the central enamel, fig. 10, *a*.

The molars, or grinding teeth of Old Billy, mentioned at

page 225, are worn in a singular manner. The first grinder of the lower jaw, on both sides, is worn down to about half-an-inch above the gum; the second, on a level with the gums, forming a hiatus into which the second grinder of the upper jaw fits, which is fully a quarter of an inch longer than the first grinder, and very uneven and unequal on the surface. About half-an-inch of the outer portion of the fourth grinder is parallel with the third, but the remainder is worn level with the jaw; the fifth and sixth molars are almost entirely worn down, except a small portion of the inner part of the sixth. The third upper one is more than half worn down, and the fourth level with the socket; part of the fifth and sixth are worn obliquely down, the cavity formed by which is occupied by the lower opposite teeth, and the worn down fifth and sixth of the lower jaw are occupied by the upper ones. In short, it is curious how mastication could be performed.

It seems probable that the natural age of the horse is from thirty-five to forty. It would be most erroneous to estimate his life according to the age at which he is worn out in a state of servitude. Few of these valuable animals live to anything like what they would do in a state of freedom, most of them being unserviceable or destroyed by excessive labour. Mr. Blaine informs us of one gentleman who had three horses, which attained a considerable age; one at thirty-five, another at thirty-seven, and the third at thirty-nine. Mr. Cully mentions one which received a ball in his neck at the battle of Preston, in 1715, and which was extracted when he died in 1758, so that he must have been forty-seven or forty-eight years of age. Albertus mentions that in his time there was a charger, proving serviceable at the advanced age of sixty, and Augustus Nephus says there was a horse in the stable of Ferdi-

nand the First, that had attained the age of seventy years. This is the oldest horse mentioned by any author as far as I know : so that in all probability Old Billy is the Parr of horses.

The incisor tooth of a horse, divided into two parts its whole length, fig. 12, and which exhibits the external cavity, *a*, and the internal cavity, *b*.

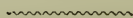
The incisory tooth of a young horse, with an opening at the middle of the anterior surface, leaving exposed the lower portion of the funnel, fig. 11, *a*.

The incisory tooth of a young horse, divided throughout, fig. 9, *a*, shows the exterior cavity, and *b*, the extremity of the funnel

Independently of the teeth, there are other signs by which an aged horse is known ; first, the temporal fossa or pits above the eyes become much sunk, grey hairs are also seen above the eyes and about the muzzle, the lips being thin and hanging, the back sinks, the withers become sharp, the quarters lengthened, spavin, windgalls, and all kinds of tumours disappear, and for the most part, the animal has a dull and heavy appearance, with hanging of the head.

Various are the tricks resorted to by dealers to impose upon the uninitiated. They endeavour by fraudulent means to make them appear most near the age at which they are of the greatest value, and when they can of course obtain the highest price for them. If too young, they endeavour to make them seem older, and on the contrary, if too old, they try to give them a youthful appearance. Besides what we have mentioned at page 218, there is a practice amongst dishonest dealers to prolong the youthful marks of the teeth of a horse by what has been designated BISHOPING, after the infamous inventor of this fraud. This trick is to imitate the appearance of the mark. A horse of eight or nine

years o. age is taken, and, by the aid of an engraving tool, a hole is dug in the surface of the corner teeth to imitate that in a horse of seven years of age. The whole is then burned with heated iron, until it leaves a permanent black stain. This is sometimes extended to the dividers, in a slight degree. But upon a narrow inspection this trick will be detected. The irregular appearance of the cavity, the diffusion of the black stain around the tushes, the sharpened edges and concave inner surface can never be successfully imitated so as to deceive the experienced. Besides, if the incisors of the upper jaw be examined, they will aid the most ignorant in detecting the imposition.



CHAPTER IX.

PRINCIPAL MUSCLES OF THE LIMBS, &c.

WE do not consider it necessary for the general reader to be acquainted with the entire muscles of the horse, although a knowledge of such as are more immediately called into active operation will aid him in discovering the seat of sprains and bruises, and to administer for their relief, in the absence of a regular practitioner.

MUSCLES OF THE OUTSIDE OF THE SHOULDER.

PLATE VI. FIG. 1.

- a. A portion of the *sterno-maxillaris*, or muscle which is common to, and connected with, the lower jaw, as well as the fore part of the chest. This is one of the muscles employed in lowering the head. It lies immediately under the skin, and

arises from the cartilage projecting from, or constituting the breast-bone, plate ii. fig. 2. It then traverses the neck in an upward direction, and is neither of great dimensions nor strength. About three-fourths of its length upwards, it changes to a flat tendon, and is exhibited, plate iii. fig. 1, *w*, above which it insinuates itself between the parotid and sub-maxillary glands, that it may be inserted into the angle of the lower jaw. It is exerted in bending the head towards the chest.

b. i. Is a muscle which is the raiser of the shoulder, and takes its rise from the nipple-shaped process of the temporal bone, *c, c*, plate iii. fig. 2 and 3, and extending down the fore part of the neck, is inserted into the middle part of the lower bone of the shoulder, and thence continued down to the arm. The use of this muscle is to bend the head; or, the head and neck being fixed, to elevate and bring forward the arm. When the horse is running at full speed, with the head thrown forward, this muscle is in powerful action.

c, d. The *serratus major*, or great tooth-shaped muscle of the shoulder, which constitutes a large proportion of the lower part of the neck. It is deeply seated, arising from the five last bones of the neck, and the two first ribs. Its lower portion springs from all the true ribs. The whole of its fibres have a downward tendency, and are inserted into the inner surface of the shoulder; by means of which the shoulder is attached to the chest, and the weight of the body thereby supported.

When the horse is in a standing position, this muscle occasionally performs another important office. The shoulders and legs, by means of the weight of the body, are fixed and immovable; consequently, having no longer any power over the motion of the limbs, it now exercises its power in enlarging the cavity of the chest, and thus materially contributes to give freedom to the action of the chest in breathing.

In treating of inflammation of the lungs, page 56, we mentioned that horses labouring under this disease would

stand night and day. The cause of this is, that the breathing is laborious and painful, and the animal in standing obtains the aid of this muscle in giving ease to the respiration. Therefore, when he does lie down, it is a pretty strong proof that the violence of the disease has abated, and consequently he no longer requires the assistance of this muscle.

- e, f.* These parts represent portions of the trapezius muscle, which is of a quadrangular form, and rises from the sides of the withers. Its base is turned upwards, and its right side forwards in a parallel line with the spine of the scapula or shoulder-blade. It occupies the space between the withers and upper part of the scapula, and is large and strong in proportion to the height of the withers, and the oblique direction or slanting of the shoulder. Its use is to elevate the scapula, as well as to draw it backward. This muscle is one of the most important as connected with the action of the horse, and prominently illustrative of the advantage of high withers and a slanting shoulder. We have represented a portion of it turned back to exhibit the muscles beneath.
- g.* Is the little pectoral or breast-muscle; it is connected with both the breast and shoulder-blade. It takes its rise from the breast-bone, and extends to the covering of the shoulder-joint, and to the muscle of the shoulder. It lies below the greater breast-muscle. Inwardly it is attached to the anterior half of the breast-bone, and to the cartilages of the first four ribs. Its action is common with that of the larger breast-muscle, (*pectoralis major*,) and to assist it in drawing back the top of the lower bone of the shoulder and the lower part of the scapula, as well as to keep the latter bone more upright in its position.
- h.* The *antea spinatus* muscle, or muscle before the spine, is placed on the external part of the shoulder, before the ridge of the shoulder-blade, and fills the whole of that space. It proceeds downwards, dividing into two parts, each of which is attached to the summits of the greater and lesser tubercles of the humerus, or bone of the arm, and also to the capsular ligament of the shoulder-joint. It is a muscle of great strength,

and extends the arm or humerus upon the scapula, and moves it forward.

- i. See the description at *b*.
- k. The *postea spinatus* muscle, situated behind the spine or ridge, and occupying the space called the fossa postea spinata. It extends to the lower bone of the shoulder, and is inserted into the upper head of that bone. It is of a triangular form, and is flattened, and broader, but not so thick in substance as the *antea spinatus* muscle. It assists the flexion of the humerus, and at the same time rolls it outwards. This is the tendon of the long extensor of the arm, which reaches from the upper angle and the posterior border of the scapula, to the point of the elbow and the inside of the arm. This muscle is a very important one.
- o, q, t*, Are the three divisions of another muscle concerned in the same office with *p*, arising from the shoulder-blade and the lower bone of the shoulder, and likewise attached to the point of the elbow by a very powerful tendon.
- t*. This is the middle flexor, which is one of the numerous and powerful muscles which bend the leg. It is also represented at *e*, plate vi. fig. 2, and is the muscle which bends the shank-bone, because it is situated precisely in the middle of the back part of the arm. It has its origin from the inner head of the lower bone of the shoulder, and is inserted into one of the bones on the inner side of the knee. The other is seen at 2, fig. 1, and is called the external flexor of the leg, in consequence of lying on the outer side of the arm, towards the back. It is inserted on the outer head of the lower bone of the shoulder; advancing towards the knee, it is tendinous; and the tendon divides into two portions, one of which is inserted into the same bone of the knee, and the other into the outer small bone of the leg. The internal flexor is exhibited at *g*, plate vi. fig. 2.
- u*. This is one of the muscles of the lower bone of the shoulder. It is the external one, whose office is to bend the arm. It arises from the inner and back part of the neck and body of the lower bone of the shoulder, and turns obliquely round it, and is inserted into the inner and upper part of the bone of the arm.

- w.* This is the extensor of the leg; it is the principal one of the fore arm, is of considerable bulk, and occupies the front part of the arm. It takes its rise from the lower portion of the body of the lower bone of the shoulder, and from its outer head. As it descends down the arm, it becomes tendinous. This tendon passes under one of the ligaments of the knee; it then spreads out, and is inserted into the fore and superior portion of the shank-bone. It is also seen at *e*, fig. 2.
- x.* The middle flexor, or bending muscle of the shank-bone. This is situated immediately on the middle of the back part of the arm. It arises from the inner termination of the lower bone of the shoulder, and is continued and inserted into one of the bones on the inner side of the knee. It is also seen at *e*, fig. 2.
2. The external flexor of the leg, and which is situated on the outer side of the arm, towards the back. It has its origin in the outer head of the lower bone of the shoulder, stretching towards the knee. It is of a tendinous character, and divides into two portions, one of which is inserted into the same bone of the knee, and the other into the outer small bone of the leg.
- 3, And extending down to 7, 4, and 5, are the principal artery, nerve, and vein of the leg.
7. This is the *perforated flexor* muscle. It arises from the lower and back portion of the inner head of the lower bone of the shoulder, and is intimately intermixed with the *perforating flexor* muscle. As it descends along the bone of the arm, it becomes tendinous, and extending to the knee, it is bound down by ligamentary bands to prevent it from starting in sudden or violent motion. From the knee it widens and partly laps round the tendon of the perforating muscle; they then descend together in contact, but are not adherent, sliding over each other freely and safely by the aid of the lubricating fluid. They are both encircled in a thick sheath of cellular substance, which is attached to them by numerous small fibres. Reaching near to the fetlock, the tendon expands still more, forming a complete ring round the tendon of the perforating muscle. This is shown at *k*, plate vi. fig. 7. The perforated tendon soon divides, and is inserted into the larger and smaller pastern-bones, its office being to bend them.
8. The subcutaneous vein of the side of the chest.

MUSCLES ON THE INSIDE OF THE SHOULDER.

PLATE VI. FIG. 2.

- a.* The flexor of the arm, which is one of the most powerful of the flexor muscles. It has its origin in the extremity of the ridge of the shoulder-blade, in the form of a large and round tendon, which extends between two prominences in the upper portion of the front of the lower bone of the scapula. This groove, or pulley, is as perfect as it is possible to suppose it; and is lined with smooth cartilage, between which and the tendon there is interposed an oily fluid, which enables the tendon to move in this pulley without the danger of being injured by friction. Passing on from this pulley, and extending beyond the head of the lower bone of the shoulder, the cord spreads out into a round fleshy substance, containing numerous tendinous fibres. It is deeply seated, and gives that fine fulness to the front of the arm. It is inserted into the head and neck of the bone of the arm, as also into the capsular ligament of the elbow-joint. It is the chief muscle, by which nearly the entire of the leg below the arm is bent.
- b, b.* This muscle is called the *pectoralis transversus*, or the muscle which crosses the breast. It takes its rise from the first four bones of the chest, and, stretching across to the inner part of the arm, is inserted into the tendinous substance which covers the muscles of the fore arm, and extending a considerable way down the arm. Its use is to bind the arm to the side of the horse, and it also keeps the legs straight before the horse when it is at speed, so that the weight of the body may be received on them in a direction most easy and safe to the horse as well as the rider, and most advantageous for the full action of all the muscles connected with progression.
- c.* This represents the disease called *capped hock*, or an enlargement of the joint of the elbow, as described at page 131
- g.* The internal flexor. It takes its rise from the inner head of the lower bone of the shoulder, and is inserted into the head of the inner splint-bone. Its office is to bend the leg, and to turn it very slightly.
- r.* The principal veins, nerves, and arteries of the shoulder and arm.

MUSCLES OF THE OUTSIDE OF THE THIGH.

PLATE VII. FIG. 1.

- a. The great glutæus muscle, or *glutæus maximus*. It occupies the anterior, middle, and external parts of the haunch. It arises from the spinous and transverse processes of several of the bones of the loins, from the sacrum, and from the different edges of the ilium, and is inserted into the protuberance of the upper bone of the thigh, behind and a little above the joint that unites the thigh to the haunch-bone. It is this muscle which gives that fulness and roundness to the haunch so much admired. It is one of the chief muscles of progression.
- b. The outer glutæus, or buttock-muscle, which can only be considered as a fleshy slip attached to the great glutæus. Its origin is as high as the spine, and it runs along the back part of the thigh in the form of a ridge, and is inserted into the smaller outer prominence of the upper bone of the thigh.
- c. This muscle arises high up from the bones of the spine, from others at the root of the tail, from the protuberance of the ischium, and from other bones of the pelvis. It is, in fact, a sort of triple muscle, as it has three heads; it is called the *triceps femoris*, or three-headed muscle of the thigh. It is inserted into the upper part of the lower bone of the thigh, and its office is to draw back the thigh when placed under the trunk, and so to throw forward the trunk of the body.
- d. This muscle descends from the sacrum, and from the first bones of the tail runs down posterior to the *triceps femoris*, and constitutes the hinder border of the haunch. It is inserted into the lower bone of the thigh, and assists in performing the same kind of motion. The whole of these muscles are very much developed in the thorough-bred horse, and hence his strength and speed, which is besides another very important point in the horse. To perform their full action, these muscles should be so prominent that the horse, when the observer stands behind him, should be perceptibly wider at the thighs than at the loins and haunch.
- e. The root of the tail, with its muscles.

- f.* This is the tendinous expansion which binds and strengthens the above muscles.
- g.* Is the *flexor metatarsi*, or muscle used to bend the hocks, or bender of the leg. It arises from the lower part of the upper bone of the thigh, and is inserted into the upper portion of the shank-bone, and also the inner splint-bone. It is a muscle of considerable power.
- h.* The *extensor pedis*. It is situated on the anterior part of the thigh, and is attached to a roughened depression upon the antero-inferior part of the external condyle of the femoral-bone, and below to the coronal process of the *os pedis*, and to the upper edge of the bone in the interval between the lateral cartilages. Its office is the extension of the foot, as well as the fetlock and pastern joints.
- j.* This letter is placed at the situation occupied by the principal nerves before they pass under the muscle. They take a direction nearly in a line with the letter *c*.
- i, p.* The *popliteus*, or *femoro-tibialis obliquus*, a short, thick, triangular muscle, extending from the upper to the lower thigh-bones, bending the stifle, and turning the limb inward.
- k.* The use of this muscle is to extend the hock. It is an exceedingly powerful muscle, having its origin in the head of the upper bone of the thigh, and, midway down the lower bone of the thigh, ending in a flat tendon, which is inserted into the joint of the hock. It is advantageously placed for powerful exertion, for it acts nearly at right angles.
- m, n.* The *peronæus*, which is another of the extensor muscles, and so called from a name given to the fibula. It arises from the whole course of the fibula, and also becomes tendinous before reaching the hock. About half-way down the shank, it occupies the same sheath as the principal extensor muscle, and is inserted along with it into the coffin-bone. The province of the extensor muscles is to raise the foot from the ground, and to bring it forward under the body.
- o.* The *flexor pedis*, one of the chief bending or flexor muscles of the foot, which has its origin in the upper part of the tibia. As it approaches the hock, it is distinguished by its large round tendon, which is seen to enter into a groove at the back of the hock. It is continued down the back of the leg in the same

manner as a similar muscle in the fore-leg. It is the performing flexor muscle of the hind leg, and assists in binding the pastern and coffin-joints.

CHIEF MUSCLES OF THE INSIDE OF THE THIGH.

PLATE VII. FIG. 2.

- b. The blood-vessels belonging to the groin.
- d, x. These represent the course of the principal anterior arteries and veins, which extend to x, and include in their range d and k.
- c. The *gracilis*, or slender muscle, which is very broad, and occupies the greater portion of the surface of the inner part of the thigh, and especially the prominent part of it. It has its origin in the lower part of the haunch-bone, and in its downward passage unites with the *sartorius*, and is inserted with it into the lower bone of the thigh. Its province is also to turn the leg.
- j. A portion of the muscle described at k, fig. 1.
- k. The *peronæus*. This muscle is attached above to the head of the fibula, continuing its attachment for the whole length of that bone, and below to the coronal process of the *os pedis*.
- l. The *popliteus*, a short muscle.
- m. The *flexor metatarsi*, or bender of the leg, which arises from the lower part of the upper bone of the thigh, and is inserted into the upper part of the shank-bone, as well as to the inner small splint-bone. This muscle has considerable power.
- n. The *extensor pedis*, described at h, fig. 1.
- o. An inside view of the perforating muscle of the foot.
- p. The veins of the posterior part of the leg.
- v. The ligamentous bands, which are of such importance in confining the tendons at the bending of the hock.
- w. Immediately behind the bend of the hock, at w, from the anterior superior part of the metatarsal bone, issues a thin layer of fleshy fibres, enveloped in cellular substance, and concealed in part of the tendon of the *extensor pedis*, with which (about one-fourth of the cannon downward) they form a union, and make some addition to its substance. In action, these supplementary fibres will brace the tendon, and are pro-

bably furnished to prevent it from being compressed by the flexion of the hock.

- y, y. The large cutaneous vein, or vein immediately under the skin.
- z. The inguinal vein, which is one of rather large size, coming from the groin, which owes its formation to a considerable branch emanating from the muscles of the thigh, and the above superficial or cutaneous abdominal vein. The femoral vein is the continuation of the external iliac trunk below the brim of the pelvis, and becoming the main channel into which the deep-seated veins of the hind extremity pour their blood.

STRUCTURE OF THE HOCK-JOINT.

PLATE VIII. FIG. 1.

This is one of the most important points of the animal, and which ought to be thoroughly known by all who possess a horse. We are convinced that this is much more frequently the seat of disease, and lameness then is suspected. Besides, upon the proper formation of this joint, the value and excellence of the horse chiefly depends.

As the knee answers to the wrist of man, and is therefore analogically regarded as the carpus, so in like manner the hock becomes the correspondent part to the instep, and is consequently considered under the technical appellation of tarsus. It consists of six small bones.

- a. The astragalus, or knuckle-bone. Its form is like that of a pulley. Its surface consists of two bold semicircular prominences, with a deep capacious groove between them; these are admirably adapted to the two grooves, parted by their middle projection in the lower extremity of the tibia, and these opposite prominences and grooves are received, and as it were morticed into each other. At the posterior part its convex surface is received into a concavity near the base of another bone, and with which it is united by very strong ligaments to the *os calcis*, c, or bone of the heel, and it projects upwards, flattened at the sides, and receives into it the tendons of powerful muscles, which

are strongly implanted into it. The lower surface is smaller than either of the others, and is irregularly flattened, and almost wholly articulatory ; it is embraced by the superior part of the large cuneiform bone. The two bones above described rest on two others, the *os cuboides*, or cube-shaped bone, *e*, behind, and the larger wedge-shaped bone, *d*, in front. This larger wedge-shaped bone is supported by two small ones, *f*, and these two smaller ones and the cube-shaped bone by the upper heads of the shank-bone, *h*, and the splint-bone, *g*. The cube-bone is placed on the external splint-bone and the cannon-bone ; the small wedge-bone chiefly rests on the inner splint-bone, which cannot be seen in our figure, and the middle wedge-bone rests on the shank-bone, *h*, alone. All these bones are connected together by very strong ligaments, which prevent dislocation, but are sufficiently flexible to allow a slight degree of motion among them ; and the surfaces which are opposed to and move upon each other are thickly covered by elastic cartilage.

- b.* The inferior end or base of the tibia. This bone reaches from the stifle to the hock ; it is connected with the round bone above, and the *os calcis* below.
- c.* The *os calcis*, which forms the posterior projecting part, called the point of the hock.
- d.* The *os cuneiforme magnum*, large wedge-shaped, or cuneiform-bone, situated immediately under the astragalus.
- e.* The *os cuboides*, or cuboid bone, situate on the outer part of the hock.
- f.* The *os cuneiforme*, or middle cuneiform bone, situated immediately underneath the large cuneiform bone, and upon the hind cannon bone.
- g.* The splint-bone.
- h.* Upper head of the shank-bone, or *metatarsi magnum*.

This joint is subjected to very great stress and weight, and consequently peculiarly liable to injury both in the draught and during rapid motion. However, nature has constructed it with wonderful skill ; and it is, by the beautiful adjustment of its parts, rendered less liable to disease than might be expected from the important and heavy duties it has to perform. The provisions made for this end

are, that the pulley-like heads of the astragalus and tibia fit deeply into each other, and are strongly confined in their position by extremely powerful ligaments, which are so contrived that they admit of the necessary freedom of the hinge-like motion of the joint, but completely prevent that lateral or side motion to which the joint is exposed in rapid movements, or passing over uneven surfaces. It will be seen, by inspecting the figure referred to, that the weight of the hind quarters is principally thrown upon the tibia, *b*, and that it rests almost entirely on the astragalus, *a*; but it will be observed that this weight does not press perpendicularly, but in an oblique direction, so that much of the concussion which would otherwise take place is avoided, by the springy action this slanting pressure produces among the several bones which compose the joint. This will be more readily understood by a reference to the skeleton, plate ii. fig. 21. As we have already shown, this joint consists of six bones, all of which are covered with elastic cartilage, and each admitting of a certain degree of motion, which diminishes concussion by the weight, pressure, and action being diffused among them all, and thus the concussion is neutralized and rendered harmless. Besides the cartilaginous covering, each of these bones has a membranous covering, which secretes the synovia or oily fluid, which we have already mentioned at page 111 and elsewhere. In fact these bones may be considered as so many distinct joints, all separated from each other and protected from injury, yet united by different ligaments, binding them so firmly together as to prevent the possibility of dislocation, yet permitting sufficient motion for the important office they have to fill. Beautiful and wonderfully powerful as this joint is, it is sometimes injured, too frequently, we lament to say, by the brutal cruelty of those to whose care

horses are entrusted. In ordinary action this joint has heavy work to perform, but often more severe exertion is exacted from it than even its admirable construction can possibly perform. Much of the lameness of the hind quarters will be found, upon careful examination, to be seated in the hock. If the exact locality of lameness cannot be detected elsewhere, we may almost consider that it is somewhere connected with the complicated structure of the hock-joint, and we may particularly refer to the various diseases of this joint described towards the beginning of chapter vi., page 130

BONES OF THE FOOT.

PLATE VI. FIG. 3.

This figure represents a back view of the bones of the pastern-joint and of the foot, and those connected with it. The coffin-bone constitutes its osseous fabric, to which the navicular bone may be regarded as an appendage. The anatomy of this part should be well understood, as it is of much importance in the action of a horse, as also very liable to disease.

- a.* The coffin-bone, with its horny laminae. It is situated within the hoof, which it nearly resembles in form, being in its outline crescent-shaped. Its form, however, varies with the natural make and morbid changes in the form of the hoof. The coffin-bone is of a soft spongy texture.
- b.* The navicular-bone, or shuttle-bone, which is situated at the back of the coffin-joint, into whose composition it enters. It is crescent-shaped. One of its extremities is directed outward, and the other inward; their points are obtuse, and are fixed by lateral ligaments to the coffin-bone.
- c.* The lower pastern, or coronet-bone. Its situation is between the pastern and the foot, and answers to the second phalanx of the human foot. Its form is nearly square.
- d.* The upper pastern is situated below the cannon-bone, with

which, from taking an oblique direction, it forms an obtuse angle. It is connected with the cannon and coronet bones, and with the two sesamoids.

- c. The sesamoid bones, or *os sesamoidea*. These are situated at the back of the articulation formed by the pastern and cannon-bones. They are articulated only with the large metacarpal bone, and are connected both with that and the pastern-bone.

FRONT VIEW OF THE PASTER.

PLATE VI. FIGS. 4, 5, AND 6.

We have described some of the injuries to which the fetlock is liable, page 123.

- a. The coffin-bone, or *os pedis*. The outline of its form is semi-lunar, convex before and above, concave below and behind.
- b. The navicular-bone, or *os naviculare*.
- c. The lower pastern, or *os coronæ*.
- d. The upper pastern, or *os suffraginis*.

NERVE, VEIN, AND ARTERY OF THE PASTER AND FOOT.

PLATE VI. FIG. 7.

This gives a representation of the nerve on the inside of the foot as it approaches the fetlock and passes over the pastern. It will be noticed that branches are given off above the fetlock, which proceed to the fore part of the foot and give it feeling. The continuation of the nerve under the fetlock principally supplies the quarters and hinder parts of the foot.

This figure is intended to show the parts and situation of the vein, artery, and nerve, which has been operated upon during diseases of the foot, to alleviate the pain the animal suffers under some of these affections. This is termed neurotomy, or cutting of the nerve.

- c. The sole of the foot.
- l. The horny crust.
- c. The fleshy, or sensible laminæ, covering the coffin-bone, the horny crust being removed.
- d. The posterior lateral ligaments.
- e. The internal, or sensible frog.
- f. The branch of the nerve which supplies the fore part of the foot with feeling.
- g. The lower part of the vein before the artery.
- h. The same vein spreading over the pastern.
- i. The continuation of the nerve, s, and proceeding downward to supply the back portion of the foot with feeling.
- j. The extensors of the foot.
- k. The deeper flexor tendon continued downward, called the *perforans*, or perforating, and contained within the other.
- l, m. The division of the nerve on the fetlock-joint.
- n. The tendinous band in which the flexors work.
- o. One of the flexor tendons.
- p. The deeper flexor tendon.
- q. The artery between the vein and nerve.
- r. The vein before the artery.
- s. The nerve on the inside of the off leg, at the edge of the shank-bone, and behind the vein and artery

ILLUSTRATIONS OF DEFECTS OF THE FORE-LEG.

PLATE VI. FIG. 8.

- a. The situation of sand-crack in the foot of the fore-leg, as described at page 162.
- b. Representation of ring-bone when it first appears on the side of the pastern. See page 126.
- c. The situation of wind-gall. See page 120.
- d. The situation and appearance of the enlargement which accompanies sprain of the back sinews. See page 117.
- e. The ordinary position in which splint occurs on the side of the shank-bone, which, however, does not produce lameness after its first formation, in consequence of its not interfering with the motion of the knee, nor does it injure the suspensory ligament. See page 114.

- f.* The tying in of the leg below the knee.
- h* The situation of the disease called mallanders. See page 132.

ATTACHMENTS IN FRONT OF THE PASTER- BONES, &c

PLATE VII. FIG. 7.

- a.* The coffin-bone.
- b, c.* Branches of the suspensory ligaments, proceeding to unite with the extensor tendon
- d.* The back of the upper pastern
- e.* The back part of the lower pastern.
- f.* Back of one of the sesamoid bones.
- g.* The lower part of the shank-bone.
- h.* The lateral cartilages of the foot.
- i.* The ligaments connecting the two pastern-bones together.

SITUATION OF DISEASES OF THE HIND LEG.

PLATE VII. FIG. 3.

- a.* The situation of grease of the foot. See page 144.
- b.* Represents a wind-gall. See page 120.
- c.* Capped hock. See page 131.
- d.* Curb. See page 133.
- e, e.* The position of thoroughpin. See page 130.

We have given a series of different representations of these, as follow, on plate vii:—

- a.* Fig. 4, Capped hocks. See page 131.
- b, b.* Fig. 5, Thoroughpin. See page 130.
- e.* Fig. 6, Bog and blood-spavin. See page 140.
- e.* Fig. 8, Curb. See page 133.
- d.* Fig. 9, Bone-spavin. See page 136.

THE PASTER AND FOOT, WITH THEIR BONES AND INTEGUMENTS.

PLATE VI. FIG. 10.

At the anterior portion of the shank-bone, immediately

below the knee, and occupying the space between the two splint-bones, two remarkable and important ligaments are situated. They are not only elastic, but also particularly well adapted to obviate concussion. They have their origin from the head of the shank-bone, and likewise from the heads of the splint-bones. They descend down the leg, and fill the groove between the splint-bones, although they are not attached to either. A little lower down they expand on both sides, and as they approach the pasterns, separate, and are inserted into two small sesamoid bones, situate at the back of the upper pastern. These form a joint, both with the lower termination of the shank-bone and the upper pastern-bone, to both of which they are united by ligaments, *f*, *i*, and *k*, but more firmly united with the pastern than the shank. Between them pass the flexor tendons, through a mucous bag, which prevents the friction to which they would otherwise be exposed in passing through so confined a situation. This ligament is continued over the sesamoid bones, and afterwards is directed obliquely forward over the pastern, where it unites with the long extensor tendon, and downward to the perforated tendon, which it surrounds, and fixes in its position, and likewise to the smaller pastern bone.

- a. The coffin-bone. This bone is fitted to, and occupies the fore part of the hoof, filling about half of it. It nearly resembles the hoof in form, being half-moon shaped: it is convex above and in front, and concave behind and beneath. It varies, however, with the natural form of the hoof, and also adapts itself to such changes in the hoof as are induced by disease. Its structure is light and spongy, and perforated with numerous holes. These are adapted for the passage of the blood-vessels of the foot, without which the circulation could not be so safely and conveniently kept up, and affords another striking example of those beautiful provisions of nature for effecting certain ends. But for this, these vessels would be frequently subjected to

great pressure, which would occasionally obstruct its free passage. The upper surface, it will be seen, is concave, for the reception of the rounded end of the lower pastern, *b*; at the back, *o*, is a depression for the perforating tendon, *g*. We have described the diseases connected with this joint at page 125.

- b*. The lower or smaller pastern-bone.
- c*. The upper or larger pastern-bone.
- d*. The shank-bone.
- e*. The sesamoid-bone.
- f*. The suspensory ligament. See rupture of this described, page 122.
- g*. The tendon of the perforating flexor, inserted into the coffin-bone after having passed over the navicular-bone.
- h*. A long ligament, reaching from the pastern-bone to the knee.
- i*. The small inelastic ligament, which fastens down the sesamoid bone to the larger pastern.
- j*. The extensor tendon, inserted into both the pasterns and the coffin-bone.
- k*. A continuation of the suspensory ligament, inserted into the smaller pastern-bone.
- l*. The navicular, or shuttle-bone. One of the chief uses of this bone is to take off a portion of the weight from the coffin-bone; and from the navicular-bone it is thrown on the tendon, which rests on the elastic frog beneath. See diseases of this bone, page 165.
- m*. The inner, or sensitive frog. This is a wedge-shaped body projecting from the bottom of the foot, together with the substance continued from it, and occupying the interval between the cartilages.
- n*. A ligament which unites the navicular-bone to the smaller pastern.
- o*. A ligament uniting the navicular-bone to the coffin-bone.
- p*. This is the seat of lameness of the navicular joint.
- q*. The sensitive sole between the coffin-bone and horny sole. It is placed between the coffin-bone and the sole; and, from its yielding nature, assists in preventing concussion, and also forms a supply for the horn of the sole. It is furnished with nervous fibres, and is highly sensitive. The lameness which

is caused by the pressure of a stone or of the shoe on the sole is occasioned by inflammation of the sensitive sole. From the same cause, corns between the crust and the sole result.

- r.* The coronary ring of the crust.
- s.* The covering of the coronary ligament, from which the crust is secreted.
- t.* The sensible laminae, to which the crust is attached.
- u, v.* The crust, or wall of the foot.
- w.* The place of bleeding at the toe.
- x.* The horny sole.
- y.* The cleft of the horny frog.

It is obvious, from the situation which the suspensory ligament occupies, that splints formed backward on the leg are more liable to produce lameness than those which are formed on the side of the leg; because they interfere with the motion of this ligament, and if large may press upon and wound it. The chief action of the suspensory ligament is to suspend the sesamoid bone in its place.

It will be seen by the figure above described, that the pasterns are united to the shank in an oblique direction, differing in degree of obliquity with the various breeds of horses. A portion of the weight which falls upon the pasterns must be communicated to the sesamoid bones. The yielding of the pasterns, taken in connexion with their oblique position, is a beautiful contrivance to prevent jarring in the action of the horse; and this is materially assisted by the sesamoid being suspended, and no bone being under it; so that the suspensory ligament gradually yields, lengthens, and contracts in proportion to the weight or pressure applied to it, thus rendering all severe concussion impossible, because it yields to the force it has to sustain, and lengthens; but as soon as the foot is raised from the ground and pressure is removed, its elastic power is again exerted, and it contracts to its natural length, and the sesamoid bone springs back into its place, and by this quick and

rapid return assists in raising the limb. This action is thus clearly described by Mr. Percivall :—"Furthermore, it seems to us that these elastic parts assist in the elevations of the feet from the ground in those places in which they are called into sudden and forcible action. The suspensory ligament, by its reaction instantaneously after extension, aids the flexor muscles in bending the pastern-joints. The astonishing activity and expedition displayed in the movements of the race-horse at speed, seem to be referable, in part, to the promptitude with which the suspensory ligament can act before the flexor muscles are duly prepared ; the latter, we should say, catch, as it were, and then direct the limb first snatched from the ground by the powers of elasticity."

The spring and elasticity in the action of a horse depends, in a great measure, upon the length and obliquity of the pasterns. It should be long in the race-horse, less so in the hunter, still shorter in the hackney, and considerably less so in the cart and dray-horse. In the latter the concussion is exceedingly little, because their movements are slow ; and the short and upright pasterns enable him to sustain and drag the heavy loads which he is destined to support and move forward. But in a horse that is to be used for the saddle, the short and upright pastern is not only a great defect, but is also very unsafe, as he is exceedingly liable to come down when trotting. Besides, such joints soon begin to knuckle over, even with ordinary work, which is the precursor of ossification of the cartilages, ring-bone, and contracted feet.

EXTERNAL PARTS OF THE FOOT.

THE CRUST OR WALL OF THE HOOF.

The formation of the foot of the horse fits him, as well

as the ass, above all other animals, for the service of man. In short, had the hoof of the horse been cleft, he would have been incapacitated for many of the useful departments of his employment ; and a correct knowledge of the structure of every part of the foot is indispensably necessary to render us scientific overseers of the farrier's art.

The crust is that portion which reaches from the termination of the hair to the ground. Its depth is greatest in front, and is denominated the toe ; it is more shallow at the sides, which are called the quarters, and still less behind, which is termed the heel. When the sole is placed on the ground, the front exhibits an angle of about forty-five degrees, differing, however, considerably in many horses to the extent of the angle. But a healthy and well-formed hoof very nearly approaches what we have stated, that is, a fourth part of a semicircle. With a greater degree of obliquity, it is said the crust has "fallen in," and when the sole is too flat, and is said to be pumiced, or convex ; and if the front be more upright than the above angle, it is the proof of a contracted foot with the sole too concave. When the crust is deep at the heel, it is a foot liable to contraction, thrush, sand-crack, and inflammation. The pastern will be found too upright, and the horse will have a bad and unpleasant action. If, on the other hand, the crust diminishes too rapidly from front to back, and the heels are low, this is always accompanied by too great obliquity of the pastern, producing a weakness in the joint, and liability to sprain of the back sinew, described at page 117. The foot itself will be weak, and have a general tendency to that hidden lameness called "the navicular-joint disease," particularized at page 165.

The general thickness of the crust in front is somewhat more than half-an-inch, becoming gradually thinner towards

the quarters and heels. This will show the necessity for shoeing-smiths being adepts in driving the nails, seeing the small space for that purpose, and more especially behind. The crust is thinner and a little higher in the inner than the outer quarter. This is another beautiful provision, because, being placed under the inner splint-bone, more of the weight rests on the inside than the outside, consequently it is enabled to expand more, and thus by its elasticity assists in lessening concussion. When, therefore, expansion is prevented by the inner quarter being nailed firmly to the shoe, corns, contraction, and sand-crack are induced. The crust is not liable to much variation in thickness, as will be seen by a reference to plate vi. fig. 10, *u* and *v*, and *c* in fig. 9, until near the top, at the coronet, or where the horn of the hoof unites with the skin of the pasterns, where it becomes abruptly thin, as will be seen on a reference to *s*, in fig. 10. Here it appears as if scooped out, and here also its colour and consistence are changed, and it appears like a continuation of the skin. This thin portion is called the coronary ring, *r*, fig. 10, which covers a thickened prolongation of the skin called the coronary ligament, *c*, in fig. 9. This extension of the skin is supplied with numerous densely set blood-vessels, connected together by a fibrous texture, many of which have the property of secreting the horny substance which forms the crust. The sensible laminae, *a*, fig. 9, have the power of secreting some horn, which furnishes an immediate defence against injury in cases where the crust is either purposely removed, or has sustained injury. This is sufficient proof in cases of quittor or sand-crack, when it becomes absolutely necessary to remove a portion of the crust. The exposed portion is soon covered by a film of a hard horny texture. The crust, however, is chiefly formed by the coronary ligament; and hence in

quitter and sand-crack its growth is slow and downwards, and is only replaced with the natural lengthening of the crust, in the same manner as in injury to the human nail. And there is situate below the coronary ligament a strip of horny matter, emanating from the frog, which seems intended for a similar purpose to that which surrounds the root of the human nail; namely, to strengthen the union of the part where it rests, and to bind together the various substances which meet there.

The crust is composed of numerous fibres, which proceed directly from the coronet to the ground, but which follow an oblique course from the heel forwards. These fibres are kept together by a glutinous substance.

In a sound condition the crust of the foot is smooth and hard, and when there are rings or other thickenings, it is a sure indication of disease in the foot, and that, too, to a considerable extent, as may be well supposed, to induce this irregularity of growth. When the front is depressed, it may be inferred that a sinking of the coffin-bone has taken place, and that the sole will be flat and pumiced. When hollow at the quarter, it is a clear indication of contraction to a considerable extent.

The perspective representation which we have given, plate vi. fig. 11, will convey a clear idea of the structure of the crust and its various component parts.

- a. The coronary ring, which is a circular, attenuated, concavo-convex part, entering into the composition of the coronet. Its extent is marked exteriorly by the whitish aspect which it assumes, and likewise by a partial separation and eversion of the outer flakes of horn around its junction with the wall, or crust below.
- b. The small horny plates which line the crust. These consist of numerous narrow laminae, or processes, arranged with the nicest order and mathematical precision upon the internal

surface of the wall. They extend in uniform parallels in perpendicular direction from the lower edge of the superior border to the line of junction of the wall with the sole, and are so thickly set, that no part of the superficies remains unoccupied by them. They are also continued upon the surfaces of the bars. They are soft, yielding, and elastic; but from exposure they become dry and rigid. Every plate exhibits two edges and two surfaces. By one edge it grows to the wall, and the other, which is somewhat thinned, hangs loose and floating within the cavity of the hoof. These are two smooth lateral surfaces, and, considering the magnitude of the lamella itself, of enormous extent; so much so, that it may be said almost to be constituted entirely of superficies. Looking at this we are naturally led to the contemplation of the great and magnificent designs which Nature evidently had in view in their formation and beautiful adaptation, viz. the production of ample surface within a small space, an end that has been obtained through the means of multiplication. A mathematical calculation was made by the late Thomas Evans, LL.D., of what the united superficies of these lamellæ amounted to, and it was found that they afforded an increase of actual surface more than the single internal area of the hoof would give, of about twelve times, or about *two hundred and twelve* square inches, or nearly one square foot and a half.

- c. These above-described laminæ are continued over the bars in this situation.
- d. The bars are processes of the wall, inflected from its heels, obliquely across the bottom of the foot. These are also seen in figure 12, c, c. They extend from the base of the heel into the centre of the foot, between the sole and the frog; behind, they are continuous in substance with the wall or crust, with which they form acute angles; anteriorly they stretch as far as the point of the frog, constituting two inner walls between that body and the sole. They seem formed for the purpose of offering resistance to the contractions of the heels.
- e, e. Two concave surfaces of the inside of the horny frog.
- f. That portion which externally is the cleft of the frog, the inferior surface of which exhibits a remarkable cavity, broad

and deep, and of a triangular form, bounded on the sides by sloping prominences, which diverge from the convexity forming the toe of the frog, and terminate at the heels. This cavity is called the *cleft of the frog*.

- g. The frog, as also exhibited fig. 12, *d, d*. In its superior surface it is continuous, uniform, and porous, being the counterpart in form of the inferior surface, presenting only reverses, where the one is hollow, and the other swelling. Opposite to the cleft is the *frog-stay*, which is elevated and bounded on its sides by two deep channels, and a hollow of shallower dimensions in the front. This bold, horny elevation is admirably calculated to form that dove-tailed connexion with the sensitive foot, which greatly augments their surfaces of opposition, and establishes their union beyond all risk or possibility of dislocation.
- h, h. The external crust, or wall; as also seen fig. 12, *a, a*., and fully described above. At the first *h* and *i* is the rounded portion of the heels belonging to the frog.
- l, Fig. 12, is the external surface of the sole, or the arched plate entering into the formation of the bottom of the hoof, and covering the whole inferior surface of the foot, excepting the frog. No individual part requires such undivided attention as the sole, as regards shoeing; since the success of this mechanical operation chiefly depends upon the paring and defence of this arched horny plate. Viewed from below, the sole commonly presents an arch of more or less concavity. It is subject to vast variety in the degree of the arc; in some feet it is of surprising depth, and in others the arch is converted into a flattened surface, and yet both seem to perform equally well. In the hind feet the sole is generally more arched than in the fore, and approaches in figure more to the oval than the circle. Its thickness is about one-sixth of an inch. That portion most elevated from the ground—that which forms a union with the bars—is nearly double the thickness of the central or circumferent parts, and next to this in substance comes the heel. This is situate at the back part of the foot, at which point the crust of the hoof, instead of being continued round and forming a complete circle, is abruptly bent in, as will be seen by a reference to fig. 12, and at *h*, fig. 11

THE CARTILAGES OF THE FOOT.

The cartilages are two broad, scabrous, concavo-convex cartilaginous plates which surmount the sides and wings of the coffin-bone. There is a groove extending along the upper part of the coffin-bone on each side, except at the protuberance, which receives the extensor tendon, and which extends to the very posterior portion of the foot, rising about the quarters fully half-an-inch above the hoof, and diminishing in height backward and forward. These cartilages occupy a greater portion of the foot than does the coffin-bone, as will be observed in fig. 7, plate vii., *i*, where it will be seen they extend far behind the coffin-bone. They are fixed into two grooves, excavated in the superior lateral borders of the coffin-bone, the navicular-bone, and the flexor tendon, and are thus perfectly secured. Below these are other cartilages connected with the under edges of the former, and on both sides of the frog.

Between these cartilages is the sensible frog, occupying the whole of the space, and answering several important purposes, it being an elastic bed on which the navicular bone and the tendon can play with security, and without concussion. This will be understood by referring to plate vi. fig. 10, *l*. Thus all concussion to the cartilages of the foot is prevented, and these cartilages kept asunder, and the expansion of the upper part of the foot preserved. This mechanism is both beautiful and important. The yielding and elastic substance of the frog is pressed upon by the navicular-bone as well as the tendon and the pastern, and being incapable of condensing into less compass, is forced out on each side of them, and expands the lateral cartilages; and these again, by their inherent elasticity, revert to their former situation, when they are no longer pressed outward

by the frog. It thus appears that by a different mechanism, but both equally admirable and referable to the same principle, namely, that of elasticity, the expansion of the upper and lower portions of the hoof are effected, the one by the descent of the sole, and the other by the compression and rising of the frog. The preservation and usefulness of the limbs of the horse are chiefly maintained by this upward expansion, when the destructive methods which are adopted in shoeing are calculated to destroy the expansion beneath. From the long-continued and violent pressure on the frog in draught-horses, and conveyed from the frog to the cartilage, inflammation is frequently produced, and too often terminates in the cartilages being turned into bony matter.

THE FALSE CARTILAGES.

From the inferior and posterior sides of the true cartilages, two fibro-cartilaginous processes extend in a forward direction towards the heels of the coffin-bone. They spread inwards upon the surface of the *tendo-perforans*, become united at their inner sides with the superior margin of the sensitive frog, are covered inferiorly by the sensitive sole, and at the same time assist in the support of the sensitive frog. They are triangular in their form, and are arched in the same manner as the sole.

Their use appears to be to fill up the triangular vacant spaces left between the *tendo-perforans* and the heels of the coffin-bone, thereby completing the surface of support for the sensitive frog, and extending that for the expansion of the sensitive sole. Bone in these situations must have proved inconvenient, by more or less impeding the impression upon, and the consequent reaction of, the sensitive frog.

CHAPTER X.

SKETCH OF THE INTERNAL ORGANIZATION OF THE HORSE.

THE LUNGS.

PLATE IX. FIG. 1., &c.

THE lungs are two spongy bodies formed for the purpose of breathing. They are contained in the lateral regions on each side of the chest, *a, a, a*, separated from each other by the mediastinum and heart, which occupy the middle region. The lungs are two in number,—the right and the left, partitioned from each other by the mediastinum. They are further divided into lobes, that on the right side, which is the larger of the two consists of three lobes, and the left has only two. These lobes are merely partial divisions, of variable extent, which serves to adapt them more accurately to the cavities of the chest, and at the same time render them fitter for the purposes of expansion and contraction. When the windpipe enters the chest, it is divided into two branches, one extending to each lung; and when these enter the substance of the lungs, they separate into numerous branches, each terminating in a little bag or cell. These bear a considerable resemblance to minute bunches of grapes. Around these cells are spread innumerable blood-vessels, being the extreme ramifications of those which conveyed the blood from the right side of the heart to the lungs, and the commencement of those which conduct it back from the lungs to the left side of the heart. These

cells and blood-vessels are connected together by an intervening substance of a fibrous and cellular texture.

The blood circulating through the capillaries of the body contribute to the nourishment of the animal system, and furnishing all the secretions, becomes changed, and is no longer capable of supporting life : it becomes of a poisonous quality, in consequence of having in it a too large portion of carbon. This must be expelled before the blood can again be rendered subservient to the purposes of life. That portion of the atmospheric air called oxygen having a strong attraction for carbon, unites with it whenever they come in contact. The chest enlarges by means of the diaphragm and the muscles between the ribs, called the intercostal muscles, and others, and the lungs expand with the chest in order to fill up the vacuum which would otherwise exist between them and the sides of the chest. These cells enlarge, and a sort of vacuum is formed in each of them, as the air rushes down and fills them ; and being divided from the venous and poisoned blood by these membranes alone, it is enabled to act upon the blood and abstract from it the carbon, and by this means purifies it, and the arterial blood is fitted for the purposes of life. This purification being performed, the chest contracts, and the lungs are compressed into smaller compass, and a portion of air, holding in it a quantity of carbon, and rendered poisonous in its turn, is squeezed out. Immediately afterwards the chest expands again, and the lungs expand with it, and pure atmospheric air is drawn into them, which is immediately thrown out again by the compression of the lungs, which, like the preceding expiration, is poisoned by the carbon of the blood. These alternate contractions of the chest and lungs constitute what is termed breathing.

When the horse is subjected to powerful exertion, it is

obvious that a more ample supply of uncontaminated blood will be required to sustain the energies of life, and violent action of the muscles forces the blood more rapidly through the veins, and hence the quick and deep breathing of the animal when running at speed. Therefore, the more capacious the chest, the greater will be the supply of pure blood, as the lungs will have more room to expand and perform the functions which we have above described. Besides, a capacious chest will fit him for a longer duration of speed.

Those who are accustomed to hunting or horse-racing, must have frequently witnessed the wonderful relief which loosening the girths have afforded to a horse after a severe gallop. The tightening being removed, permits the chest to expand and contract to a greater extent, and consequently yields a larger portion of purified blood. A very short rest will sufficiently manifest how much the exhausted energies of those organs will recover when the greater expenditure is not necessary.

Even for animals which are not required to possess speed, such as cart, waggon, dray, and farmers' horses, a capacious chest is equally necessary; for this reason, that in these there is generally a great accumulation of both flesh and fat which require a large portion of the blood to supply his growth; consequently large and ample chests are requisite so as to afford room for the necessary provision of a rapid purification of the contaminated blood.

Diseases of the lungs are among the worst to which horses are liable, and most frequent of occurrence, and hence the most likely to impair his usefulness. A horse labouring under diseased lungs is unfit for any service, nor can all the art of the ablest veterinary surgeon produce even a semblance of alleviation, and hence is too frequently unjustly considered as unskilful. In other complaints, such

as glanders, the veterinary art may keep a horse in a condition to be ridden or driven at considerable speed without knocking him up, but not so with diseased lungs.

It is not to be wondered at, that so many horses are afflicted with lung complaints, most of them resulting from carelessness. The poor animals are too often over-heated, and afterwards put into cold stables in a state of profuse perspiration, and allowed to dry. This should never be the case. The animal ought to be instantly rubbed down, until his coat is quite dry. If this is not attended to, inflammation of the lungs and a host of other complaints may be the consequence.

THE HEART.

The heart is enclosed within a membrane or bag, called the pericardium, plate ix. fig. 1, *c*, and both together occupy the middle space of the cavity of the chest. The pericardium contains within it and throws out a pale yellow serous fluid, which serves to lubricate the contiguous surfaces of the sac, and to preserve them against any ill consequences arising from friction.

The use of the pericardium is to confine the heart in its situation, to sustain it in its reciprocal action with the lungs, and guarding it from any undue collision, and to serve as a guard to the heart. When the pericardium or the heart becomes inflamed, an undue secretion of this fluid is induced, sometimes to such an extent as to obstruct the beating of the heart. When such is the case, the animal is said to have dropsy of the heart. Its symptoms are very similar to inflammation of the lungs, and consequently it is difficult to detect which of the two maladies the animal labours under.

The heart itself, fig. 1, *b*, is the organ by which the blood

is circulated through the body. It is of a conoid form, with the base turned uppermost, and is opposed to the fourth, fifth, and sixth vertebræ of the back, from which it is suspended in its situation in the middle of the cavity of the chest, by the attachment of the venous and arterial trunks immediately connected with it. Its apex hangs loose within the cavity of the pericardium, pointing downwards and backwards, and rather inclined towards the left side. It is composed of four cavities, the two uppermost are called auricles, from their form being somewhat like the ear of a dog; and two ventricles, or belly-shaped cavities, which occupy the substance of the heart. Although the heart is chiefly composed of fleshy fibres, still a tendinous substance is found in the middle, which seems to be the common medium of attachment between its auricles, ventricles, and vessels, one to another.

The heart is supplied with blood by two coronary arteries, the first branches are given off from the aorta, or great artery. Its veins pour their blood into the coronary vein, by which it is returned into the right auricle.

There are two orders of blood-vessels, arteries and veins; the former conduct the flood *from* the heart to all parts of the body, nourishes it, and returns to the heart through the veins. It enters the auricle on the right side, where it is accumulated as a reservoir, until there is sufficient to fill the ventricle below. The auricle then contracts, and forces the blood into the ventricle, which in its turn contracts, and drives the blood through an aperture that leads to the lungs. It cannot be drawn again into the auricle, because there is a complete valve, like that of a sucker of a pump, to prevent this. The blood which has thus been forced into the lungs traverses every portion of them, by the minutely ramified blood-vessels, and entering all the little

cells, there to undergo the important change of being subjected to the action of the atmospheric air which the lungs have inhaled, and be purified by the oxygen contained in the air, and from which substance it owes its beautiful red colour. It is now carried to the left auricle, and from thence it descends to the left ventricle, and by the powerful closing of the ventricle is propelled into the arteries. These vessels, in all their numerous ramifications, emanate originally from two main trunks, the pulmonary artery and the aorta ; the branches of the former penetrate the lungs, and the latter are spread over every part of the body.

The aorta, with its numerous branches, when taking them as a whole, may be compared to a short but straggling and very branching shrub or dwarf tree, of luxuriant but extremely irregular growth. It takes its rise from the left ventricle, and the blood by the force communicated to it by the sudden contraction of the ventricle, and aided by the elastic power of the arteries, keeps them open and free from obstruction, and likewise, by the pressure of the muscular and elastic coats, endeavouring to return to their former dimensions, flows in a continuous stream through every portion of the frame.

The pulmonary artery is a vessel of larger dimensions and calibre than the aorta. It has its origin in the posterior upper part of the right ventricle of the heart, and winding upwards to the root of the left lung, there divides into what are termed the right and left pulmonary arteries. These divisions immediately enter the substance of their correspondent lungs, and therein ramify in all directions, like the minutest threads, the branches regulating their course and division by the ramification of the bronchial tubes.

The heart is liable to disease, as it is sympathetically

affected by almost all the complaints incidental to the animal frame, no matter how distant that malady may be from it. An injury of the foot will in a very short time cause the heart to beat, or pulsate, with double its ordinary quickness. Indeed it frequently happens that inflammation of the heart will ensue through sympathy with some remote diseased portion of the animal. When such an affection takes place, immediate and copious bleeding should instantly be resorted to, otherwise the animal may die. This is not a complaint of very frequent occurrence, but extremely dangerous; and such is the strength and rapidity of the heart's action, that its pulsations may be distinctly seen at the animal's side, and even heard at some yards distance. In this complaint the animal exhibits great energy of expression of countenance, with a quick and restless motion.

THE PULSE.

As the pulse is so intimately connected with the action of the heart, we may with propriety treat of it in this place. As in the human subject the pulse is a useful key to the health of the system, it is likewise of the same value to those practising the veterinary art.

Although there are several parts in a horse where the pulse may be felt, yet the most convenient is at the lower jaw, a little behind the part where the submaxillary artery and vein, and the parotid-duct, pass under the jaw. See plate iii. fig. 1, *r*. At this spot the pulsations may be not only distinctly counted, but also the character of the action of the pulse accurately ascertained; which is of much importance, because its hardness and softness indicate certain conditions of disease. Many persons place the hand on the side to ascertain the state of the pulse; but this will only

give the number of its beats in a minute, without its condition.

In a healthy state, the pulsations in the heart of a farmer's horse range from thirty-five to thirty-seven in a minute ; in the thorough-bred horse from forty to forty-two. These are considered the standard healthy pulses ; but even in health these are subject to some variation either above or below these numbers of beats. It must be understood that this is the condition of the pulse when the animal is at rest, or at least when he is not in the act of using exertion ; because, even in pulling a heavy load or during trotting, and for a short time after both of these, the pulse will be higher, according to the degree of exertion to which the horse has been subjected. Besides, exercise, a warm stable, and fear will materially augment the action of the heart.

When the animal is at rest, and the pulse reaches fifty or fifty-five beats in a minute, then it may be suspected that there is a degree of fever, and its case must be investigated. When it is from seventy to seventy-five, a high state of fever will be the consequence, and active means must be resorted to. If the pulse should get so high as one hundred to one hundred and five, the malady inducing this will be of such a severe kind as to preclude the hope of recovery ; and unless it can be speedily reduced, the vital energies must soon be exhausted.

When horses are labouring under disease, it is necessary to approach them with caution, because either abruptness or speaking harshly to them will have a tendency to raise the pulse ten or fifteen degrees. The animal should be patted and spoken to gently, and the pulse felt a second time before its real state can be determined. The conditions of the pulse may be arranged under the following heads :—

QUICK PULSE.

This is always an indication that the animal is under some excitement. This will vary in degree according to the force of the exciting cause. The business of the veterinarian is to ascertain and remove this as speedily as the circumstances will permit. We have above stated the number of beats in a healthy and diseased state. The heart may be excited to more frequent and also to more violent action. It may contract more powerfully upon the blood-vessels, and consequently drive the fluid with greater force through the arteries, and the expansion of the coating of the arteries will be greater and more abrupt. The quickened pulse invariably indicates a tendency to fever and irritation.

SLOW PULSE.

This is an indication of an oppressed condition of the heart's action, and accompanies diseases of an opposite kind from those which are the concomitants of a quick pulse. It proves that the malady with which it is connected results from a deficiency of nervous energy. It is always a concomitant of sleepy staggers.

HARD PULSE.

This is indicated by a thumping and jerking feeling under the pressure of the finger, and at the same time accompanied by a fulness in the flow of blood through the vessels. This is a sure sign that a considerable degree of fever exists, and in this case immediate and copious bleeding must be had recourse to.

SMALL PULSE

Is indicated by feebleness in the beat and a feeling of

languidness in the circulation, very easily discerned under pressure of the finger. It, however, sometimes happens that small pulse may be accompanied by hardness and jerking; but still the remarkable *smallness* in the circulating fluid will be perceptible. This condition is caused by the irritability of the heart causing a contraction of the ventricle before it is properly filled with blood. Small pulse shows that some dangerous condition of disease is to be apprehended, as it invariably accompanies inflammation of the bowels.

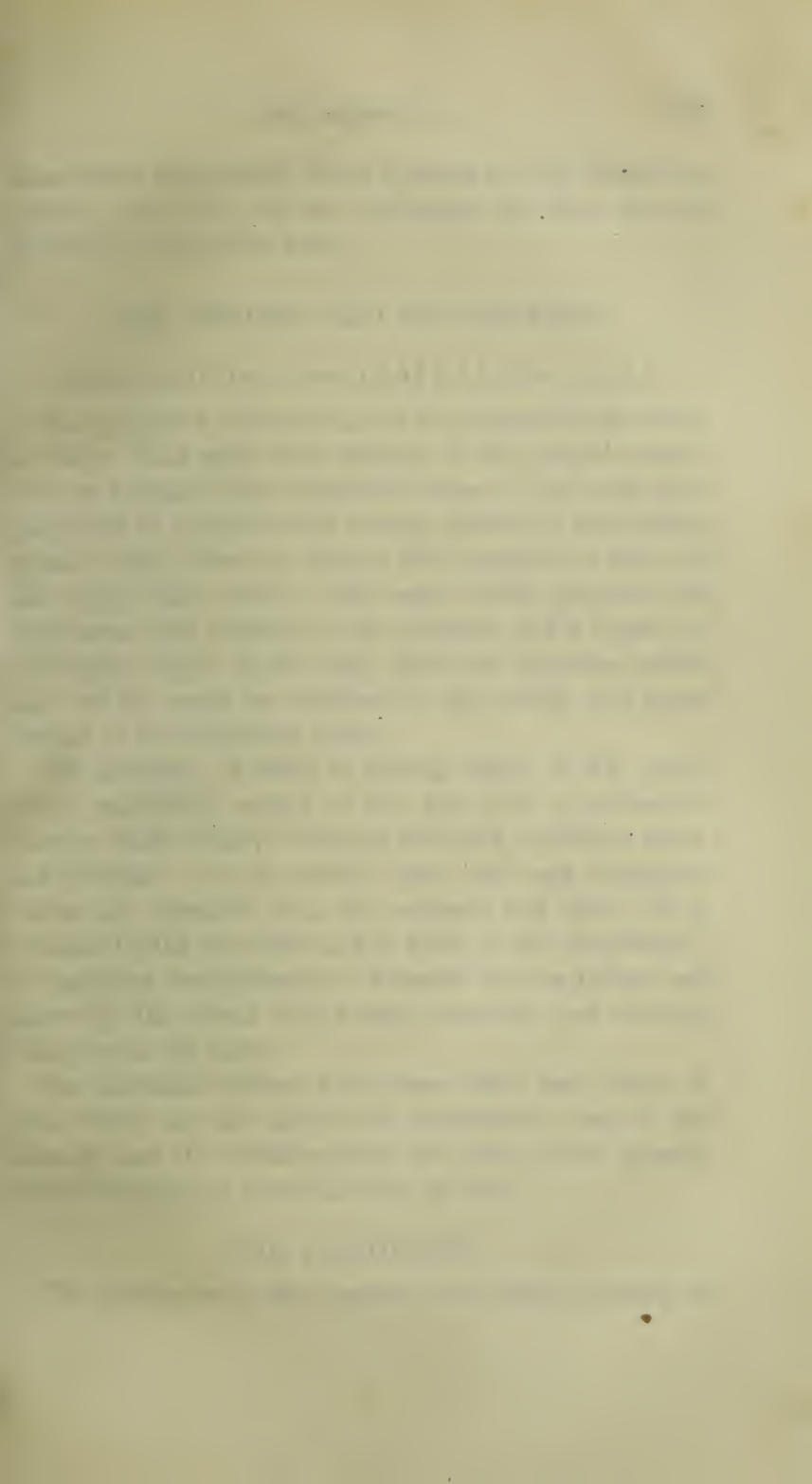
A WEAK PULSE.

This is caused by a feeble action of the heart, as the stream of arterial blood is flowing slowly, and hence is hardly to be felt. It indicates debility, and accompanies complaints the reverse of fever. Stimulants are generally necessary in this condition of pulse.

OPPRESSED PULSE.

When the arteries are fully distended with blood, and the pressure upon them is greater than their calibre will convey with ease, owing to some obstruction in their interior, and the action of the heart is unable to press forward the current, and in consequence the pulsation feels irregular and unequal, the pulse is said to be oppressed. In sudden inflammation of the lungs this condition is common. They are gorged and overloaded with blood, which cannot force its way through their minute vessels. It has been invariably found that after copious bleeding, an oppressed pulse has been much increased. This arises from a portion of the blood being removed from the choked vessels, which enables that which remains to flow on without interruption.

The pulse is subject to various modifications besides



those above enumerated, which it would be very difficult to explain, and which are well understood by those who are practised in feeling the pulse.

THE ABDOMEN AND ITS CONTENTS.

PLATE VIII. FIG. 5, AND PLATE IX. FIGS. 1 AND 2.

Having given a brief account of the contents of the chest, or rather those parts most essential to the general reader, we now descend to the abdominal viscera. The heart and lungs may be considered the moving powers of the animal system, which, however, require the materials to keep up and supply that motion. The organ which prepares and distributes that stimulus is the stomach, and is lodged in the higher region of the belly, while the intestines which carry off the waste are situated in the middle and lower portion of the abdominal cavity.

The abdomen, or belly, is formed chiefly of soft parts, which principally consist of the four pair of abdominal muscles which mainly constitute its broad superficies below and laterally. In its interior part, the most important viscera are situated, viz., the stomach and liver. It is bounded by the false ribs, and in front by the diaphragm ; its posterior compartment is bounded by the pelvis, and above by the dorsal and lumber vertebræ and muscles belonging to the loins.

The abdominal viscera of the horse differ from those of man chiefly in the shape and comparative size of the stomach, and the intestine called the colon ; their general relative situation is much the same in both.

THE PERITONEUM.

The peritoneum is the membrane that lines the cavity of

the belly, and is reflected upon the contained viscera. It presents a shining secreting surface, of a whitish aspect, and considerable transparency. Its internal surface is smooth and humid. The use of this organ is to secrete a serous fluid, which is intended for lubricating every part of the membrane, in consequence of which those viscera that are continually moving within the belly glide over one another, not only without friction, but without exciting the least consciousness of their motions on the part of the animal himself. In addition to this, the peritoneum furnishes most of the viscera with a complete external tunic, and thereby adds strength and firmness to their several textures. It attaches, supports, and confines those viscera (within certain limits) in their respective places; and it strengthens the abdominal cavity altogether by its uninterrupted extension everywhere through and around it.

THE DIAPHRAGM.

PLATE IX. FIG. 1., *h*.

This forms a fleshy and tendinous partition, dividing the cavity of the chest from that of the abdomen. It is of a broad circular form, flattened from before backwards; its front surface is convex, and concave behind; divided or forked above, and having two elongations or appendices extending backwards, with pointed extremities. On that side next the chest it is invested by the membrane which covers the lungs, and towards the belly by that which covers the intestines. It adheres to the spine, the ribs, and the breast-bone, by strong muscular fibres. Its structure is fleshy and tendinous. The fleshy parts are those which form the circumferent portions of the large muscle, and the principal part of the crura or appendices. The tendinous parts con-

ture some portion of the intestines insinuates itself into it, and there becomes entangled, so that an incurable obstruction is the consequence. In the event of a large aperture, the intestines protrude through it, and by pressing upon the heart totally suppress respiration. This organ performs such an important part in the act of breathing that it may be easily imagined, while the respiration is strong and hurried, it is liable to be ruptured.

The gullet passes through the diaphragm into the stomach, and in which it terminates. See plate viii. fig. 4, *f*.

THE STOMACH.

PLATE VIII. FIG. 4, AND PLATE IX. FIG. 1.

The stomach is situated in the left side of the belly, resting upon the large intestines. Its anterior or convex part lies upon the diaphragm and the false ribs of the left side ; its posterior or concave part is concealed by the intestines, and its lower surface is invested by the omentum ; attached to its left extremity is the spleen, and its right end is in contact with the left and middle lobes of the liver.

The stomach may be compared to a pouch or bag, formed for the reception of the food as it passes through the œsophagus. Perhaps no animal, in proportion to its size, has so small a stomach as the horse. The stomach of a middle-sized man, of about twelve stone weight, will contain somewhat more than three quarts of water ; whereas that of an ordinary-sized horse, whose bulk and weight exceeds that of the man by *eight* times, will only contain three gallons, or four times the quantity of the man's. However, we must bear in mind that the stomach, like other hollow muscles, has the property of accommodating itself to the bulk of the matter which it contains.

This organ is of vast importance in the animal economy ; in short, it is indispensable to their being ; no animal is without one. This is not the case with the brain, and much less with the heart, as we know that animal life is sustained in some species without either. That great anatomist, John Hunter, in his physiological disquisitions, showed that the existence of a stomach was the chief characteristic between animals and vegetables. The stomach has been truly said to be the organ of digestion, because within it the aliment transmitted to the œsophagus in a crude state undergoes its primary and principal change in a process, the object of which is to convert it into material for the support of the body, and the distribution and transmission of those fluids which sustain life and motion in its different parts.

It must be obvious from the situation of the stomach, that it is not only attended with great inconvenience and pain, but also danger, to work a horse hard after a full meal. Indeed many have sustained irreparable injury from this cause. By the action of the diaphragm, the stomach must be displaced and forced back in the belly by every contraction of the diaphragm or act of inspiration ; then in proportion to the fulness of the stomach will be the weight to be overcome in breathing, and hence the increased labour of the diaphragm, and consequently the exhaustion of the animal. Besides, if the stomach is very full, and consequently distended, its weight may prevent it from being forced sufficiently far back to allow ample room for the necessary volume of air which the animal requires during a state of exertion. Hence the short, frequent, and oppressed breathing during rapid action, and which too often destroys the animal. On a journey, a horse should therefore be fed moderately and more frequently than in a state of rest, and care should be taken not to allow him too much

water, which ought also to be given in small and frequent quantities.

It would seem that Nature had wisely foreseen, that as the horse was destined to be the servant of man, and to render him more valuable and fitted for the labour that would be required of him, it became necessary to diminish the inconvenience and danger from pressure which would necessarily accompany a large stomach, that the animal should have one proportioned to the situation he was destined to fill in creation. The great bulk and consequent expenditure of his frame, require a large quantity of food to be consumed to afford nutriment. Yet the stomach is wisely formed small, to prevent pressure as much as possible; and in addition it has the power of rapidly decomposing the food, which speedily descends to a portion of the intestine remote from the diaphragm, where the pressure of the food cannot inconvenience him. Indeed the whole of his digestive system is quick, and consequently his food passes rapidly through him; otherwise life never could be sustained, considering the small proportional nutriment contained in the ordinary food of the horse.

We shall now proceed to describe the several parts of the stomach. The situation which the stomach occupies in the abdomen will be seen by a reference to plate ix. fig. 2, *b*; and its general form and several parts are represented in plate viii. fig. 4.

- a, a.* The mucous or villous portion of the stomach in which the food is chiefly digested, or converted into a soft and pulpy substance. It extends over that portion of the stomach left unoccupied by the cuticular part. It is of a yellowish cast, inclining to red in some places.
- b, b.* Is that portion of the stomach which is covered by cuticle or insensible skin. This cuticular substance is of the same nature as the lining of the œsophagus, with which, indeed, at

the cardia it is continuous. Numerous small openings are visible upon its inner surface, through which issues a mucous fluid, the product of follicular glands underneath, which is useful in the process of digestion, and where it may be said properly to commence. This is called the gastric juice, which mixes with the food already softened, and converts it into that fluid substance called chyme.

- c, c. The margin which separates the cuticular from the villous portions.
- d. The entrance from the gullet into the stomach. The circular layers of muscles which invest this part are very strong and thick. By their powerful contractions they assist in rendering it difficult for the food to be returned or even vomited. This orifice is called the cardiac orifice, in consequence of its contiguity to the heart. It is constantly closed by strong muscular fibres, except when the food is passing through it into the stomach. Although this assists materially in preventing the return of the food, it is the construction of the soft palate which mainly contributes to the prevention of vomiting in the horse.
- f. The œsophagus, or gullet, through which the food is conducted from the pharynx into the stomach. It has its commencement in the pharynx, and is there placed at the upper and back part of the larynx, the first part of its course being behind the trachea, between it and the cervical vertebræ. After proceeding a short way down, it inclines to the left, and soon after makes its appearance altogether on the left side of the trachea, and continues so in its passage down the neck. This will explain what has puzzled many, why we look for the bolus during the act of swallowing on the left, and not on the right side of the animal. Accompanying the trachea, the œsophagus enters the chest between the first two ribs, at which part, running above that tube, it diverges from the trachea, and in connexion with the superior mediastinum, and traversing that cavity a little way below and to the right of the aorta.
- g. The communication between the stomach and the first intestine.
- i. A small orifice through which a portion of the secretion of the pancreas enters the intestines. Its direction will be seen by the probe which is passed through it. The pancreas, other-

wise called the sweetbread, is a glandular body lying across the spine in the epigastric region, underneath the crura of the diaphragm, immediately behind and a little above the small curvature of the stomach.

- j, k.* Two probes passed through the common orifice through which the bile and the pancreatic secretion pass into the first intestine. The part where the two probes intersect each other mark the spot where these tubes unite.

THE LIVER.

PLATE IX. FIG. 2, *a.*

This organ is situated between the stomach and the diaphragm. Its right is in contact with the duodenum and the right kidney, and the middle and left divisions with the stomach. It is confined in its place by means of what have been termed its ligaments, which, with the exception of one, are nothing more than elongations proceeding from the peritoneum. The one attaching the right lobe to the diaphragm is called the right ligament; a similar one connecting the left lobe to it, the left ligament; between the diaphragm and its middle lobe, is the suspensory ligament; and immediately above that, surrounding the posterior *vena cava*, is the coronary ligament; and that within the folds of the suspensory ligament are the remains of the umbilical vein.

In our description of the heart, at page 263, we mentioned that the blood which is conducted to the different parts of the body by the arteries, is returned to the heart by the veins. But that portion of the blood which is returned from the stomach, intestines, pancreas, spleen, and mesentery, instead of taking a direct course to the heart, passes first through the liver. Two large vessels conduct it thither, and as soon as they have entered its substance,

they spread out into innumerable minute branches, traversing through every part of the liver. During the passage of the blood through the liver, a fluid is separated from it, which is called the bile. This is carried by the gall-duct, *l*, into the duodenum, *m*, in such quantities as are required for aiding digestion. The horse has no gall-bladder, and, consequently, the bile flows into the duodenum, or first intestine, *m*, immediately after it is separated from the blood. As we have already mentioned, the stomach of the horse is small in proportion to the quantity of food which he must consume, and consequently must be much oftener emptied; and hence the necessity for uninterrupted flow of bile to aid the process of digestion.

The diseases connected with the liver are inflammation and jaundice, treated of at page 89.

THE OMENTUM, OR CAUL.

This is a doubling of the peritoneum, investing the lower portion of the stomach, to the great curvature of which, and to that portion of the colon which crosses the spine to form the sigmoid flexure, or last turn, it is attached. The omentum is small in the horse, and seldom contains much adipose matter. It is situated between the intestines and walls of the abdomen, to prevent concussion and injury during rapid movements of the horse. See fig. 2, *c*.

THE SPLEEN.

This is situated on the left side of the stomach, fig. 2, *e*, and between it and the short ribs, with the hinder cartilages of which its margin beneath corresponds, so that if the belly were pierced from the left side posteriorly to the last rib, this organ would escape injury. It is attached to the left half of the great curvature of the stomach, but the

chief portion of it lies behind and rather above the stomach. Its anterior end comes in contact with the left lobe of the liver ; its posterior is connected to the left kidney, and concealed by the convolutions of the colon. The particular use of the spleen has never been yet satisfactorily ascertained.

Great enlargement and also rupture of the spleen has been noticed after the death of horses ; but nothing is known of the causes nor the symptoms which indicate disease of this organ.

THE PANCREAS.

This organ is situated between the stomach and left kidney. It lies across the spine, within the epigastric region, underneath the crura of the diaphragm, immediately behind and a little above the small curvature of the stomach. Its structure bears a strong resemblance to that of the salivary glands, contiguous to the mouth, and secretes a fluid very much resembling common saliva. This fluid is conducted into the intestines by a duct, which enters at the same aperture with that which proceeds from the liver. There is every reason to believe that this fluid aids digestion, but in what way has not been ascertained.

THE DIAPHRAGM, OR MIDRIF.

The cavity of the chest consists of two compartments, and the division or separating wall between which is called the diaphragm, as more fully described, page 270. See fig. 2, *i*, *i*, and fig. 1, *h*.

THE KIDNEYS.

These are two somewhat oval, reddish-coloured bodies, which occupy the back part of the abdomen, and are

situated under the loins. Their form is like that of a kidney bean. The right kidney lies most forward, and is placed under the liver; the left one lies more backward, rather behind the stomach and spleen. They lie behind and are concealed by the intestines, consequently upon dissection they are not visible until the intestines are removed, as will be seen by plate ix., fig. 1. In fig. 2 these are removed, and the kidneys, *d, d*, are exposed, as well as other organs which occupy the chest and abdomen. The chief function of the kidneys is the secretion of the urine, and carrying off an ingredient which enters into its composition, called the *urea*, a substance which, if allowed to circulate with the fluids, would prove poisonous. To each of the kidneys a large artery runs, which conducts nearly a sixth part of the blood of the body to them. These branch off into innumerable minute fibres, which ramify every portion of the substance of the kidney, and by this means the watery portions are separated from the blood, and conducted to the bladder. The urine varies more in its quantity and quality in the horse than in any other animal with which we are acquainted, and hence the necessity of attending to its appearance and composition during disease; because attention to this enables the veterinarian to detect the disease, and also to judge the quantity of medicine which may prove beneficial to the animal. In the application of these much good or much evil may be the result. Ignorant ostlers, seeing the effects of nitre in promoting staling and also in purifying the urine, are too prone to use it with indiscretion. These diuretic medicines, if used in too great quantities, stimulate the kidneys to separate more of the watery fluid than they do in a natural and healthy condition, and the effect is to lessen the quantity of blood. Although this property in nitre is advantageous in many

disorders where the heart is burdened by the pressure required to force the blood forward through the arteries in inflammatory complaints, it is easy to see that taken in too great quantities, or too frequently, may not only render it too thin, but also deficient in quantity.

Diuretic medicines are of much value in many diseases. For example, in swellings of the legs the use of diuretics have the effect of carrying off—as we have above shown—a greater than ordinary quantity of the watery portion of the blood. Nature has always a tendency to keep in equilibrium all her machinery and laws; consequently, the absorbent vessels are stimulated to greater action in order to compensate for this waste, and take up and convey into the circulation that portion of the fluid which had affected the limbs. In short, many horses are so predisposed to swelling of the limbs, that it is impossible to render them fine without the use of diuretics. We shall treat this part more fully in our chapter on medicines; but we may in the meantime offer the following precautions in the use of diuretics. First, let the horse have as much drink as he will take, as this will promote the urinary evacuations. Secondly, the stable should be kept cool, and the clothing thin; because, if this is not attended to, the medicine given to stimulate the kidneys will pass off by perspiration, and the effect intended will be thus frustrated. It is a law of the animal economy that when the skin gives off perspiration, the action of the kidneys is reduced.

Turpentine is an excellent diuretic. It may be given in liquid, or made into balls with lintseed-meal and half-a-drachm of ginger, formed with palm-oil. Half-ounce of turpentine is a sufficient dose to be given at a time; but where fever exists, nitre or digitalis should be administered.

it from the acrimony of the saline and other matters contained in the urine ; this mucous matter being perpetually washed off from the surface of the inner coat by the urine, is kept constantly renewed, and it is sometimes voided in considerable quantities. When this is the case, it may be apprehended that the urine is unusually acrid, or that calculi or other irritable matter is within the bladder. About an inch before the cervix or neck of the bladder, in the sides of the bag, the orifices of the ureters are placed, which enter the bladder in an oblique direction, and prevent any reflux of the urine at the time the bag is contracting, and which gives them the property of valves. The bladder terminates in a small neck, round which is a powerful muscle, which keeps the passage closed and retains the urine until the animal wishes to expel it ; or when the bladder contains a certain quantity of fluid, the muscular coat contracts, and, the lungs being filled with air, the diaphragm is rendered convex towards the intestines, and they are by that means pressed upon the bladder, and by their united powers the fluid is forced through the sphincter muscle at the neck of the bladder and escapes. We have described the disorders to which the bladder is liable at page 93.

THE INTESTINES.

The intestines are cylindrical tubes of very unequal dimensions, forming one continued but convoluted canal from the lower orifice of the stomach to the anus, in which the process of digestion, begun in the stomach, is completed and ultimately expelled in the form of fæces.

The abdominal viscera, taken collectively, cannot be said to occupy any particular region of the belly, for they are spread chiefly over the lower portions of it ; immediately

supported by the abdominal muscles, and one or more of them are found in every portion of the cavity of the belly, and collectively fill nearly its whole space.

The length of the intestines of the horse of full dimensions is ninety feet, or between eight and nine times the length of his body. Those of man are about sixty feet long, or six times the length of the body.

The food having been partially digested in the stomach, and converted into a substance called chyme, passes through the pyloric orifices into the intestines. The length of the intestines in animals bears a proportion according to the nature of the food. The nutritive portion of vegetables is extracted with much more difficulty than with animal substances, and hence the necessity of the alimentary canal being much longer and more complicated in the horse and other animals which feed upon vegetables. This viscera is divided into the small and large intestines, from the latter exceeding in volume the former. Each of these is subdivided into three parts, all of which are composed of three coats; the first, or external one, is called the peritoneal; the second, or middle, the muscular; and the third, or internal, the villous or mucous coat.

The peritoneal coat is a covering continued from the peritoneum itself, which includes the mesentric vessels and nerves in its course to the intestines, and connects them to the spine, to one another, and to other viscera. It intimately adheres by fine cellular tissue to the muscular coat underneath. It serves to strengthen the tubes, and to furnish a lubricating serous perspiration, which renders the membrane smooth and moist, and serves to prevent all friction and concussion. By the aid of this coat the bowels are confined in their proper situations. If the intestines were allowed to float loosely in the abdomen, they would

be liable to constant entanglement and injury by jolting during the rapid and violent motions which the horse is subjected to.

The middle, or muscular coat, like that of the stomach, is composed of two kinds of fibres, one of which is longitudinal, just under the peritoneum, and stronger circular fibres are situate more inwardly. In consequence of these combined actions the intestine may be contracted in all directions. It is by the action of the circular fibres that the aliment is gradually forced through the intestines.

The villous, or mucous coat—so named from its surface being studded with small glands which give out a mucous fluid to lubricate the coating, and sheaths and defends it from acrimonious or mechanical irritation of the aliment, and also to facilitate its passage through the intestine. It is also crowded with innumerable small apertures, which are the mouths of minute vessels, by which the nutritial portion of the food is absorbed, and which is ultimately conveyed into the circulation and distributed through every part of the body.

Having given an account of the structure and appearance of the intestines generally, we shall now enter into their peculiarities.

PLATE VIII. FIG. 5.

This gives a general view of the appearance of the belly with the intestines, as they are presented without any of them being removed, the skin of the abdomen only cut open and thrown back so as to expose the viscera.

a, a, a, a. The colon, which in the horse is a gut of enormous size, being the longest and most capacious of the large intestines. Such is its capacity, that it will contain about twelve gallons of water. The course and figure of this intestine are peculiar. It begins at the head of the colon, and expands into a cavity

larger in dimensions than the stomach itself; it then begins to contract, and continues to do so gradually until it has completed its second convolution round the cæcum, or blind gut, where its dimensions are not more than one of the small intestines.

b. The cæcum, or blind gut, which is the first subdivision of the large intestines, originating in a large capacious receptacle, called the *cæcum caput coli*, or blind head of the colon, from which it extends downward and terminates in a blind extremity. The cæcum differs from all the other intestines in having but one opening into it, so that all the substances which enter into it must reascend into the caput coli, in order to be carried through the intestine. The exterior parts are braced by three longitudinal bands, and puckered by them into three sets of cells internally, which will be better understood by a reference to plate ix. fig. 3.

c. A portion of the mesentery. It is a duplicature of the peritoneum, which bears this appellation. The colon is attached in like manner to the bone by a production of the same membrane, called the mesocolon, and the rectum is kept in its place by a similar reflection, called the mesorectum.

d, e, Are portions of the small intestine.

f. The beginning of the colon.

g. The rectum. As soon as the colon has reached the basis of the sacrum, it ends, and it then assumes the name of rectum, being to a certain extent straight; however, it is not perfectly so, as it follows the curve of the bone. It terminates by a large extremity, called the anus. The rectum will hold about three gallons of water or fluid matter. The outer extremity is furnished with a circular muscle, called the sphincter ani, the use of which is to keep the anus closed, to retain the feculent matter until so much of it be accumulated in the rectum as to excite a desire to discharge it.

PLATE IX. FIG. 1.

This figure is intended to display the relative situations of the principal organs, with only part of the intestinal canal. These lie exteriorly to other important viscera

- a, a, a.* The different lobes of the lungs, already described, page 259.
Its vessels are seen upon its surface.
- b.* The pericardium, or bag which surrounds the heart.
- c.* The heart.
- d, d, d.* The colon, already described in plate viii. fig. 5, *a, a, a, a.*
- e.* The ligamentous bands of the colon, which pucker it into folds.
- f, f, f, f.* The ribs.
 - g.* The sternum, or breast-bone, removed from its junction with the ribs, and thrown back to exhibit the contents of the chest beneath.
 - h.* The diaphragm, already described, page 270.
- i, i, i, i.* The skin thrown back, to show the contents of the chest.
 - j.* One of the small intestines.
 - k.* The ensiform, or sabre-shaped cartilage.
- l, l, l.* The neck.
 - m.* The situation of the trachæa, or windpipe.

PLATE IX. FIG. 2.

The chief organs represented in this figure are principally hidden by those described in the last figure.

- a.* Lobe of the liver.
- b.* The stomach, described at page 272.
- c.* The omentum, or caul, described at page 277.
- d, d.* The kidneys, described at page 278.
- e.* The spleen, described at page 277.
- f.* The uterus, or womb, which is a hollow membranous organ, united to the anterior part of the vagina, and in the mare is of a striking and peculiar form. Its body spreads out anteriorly into two horn-like processes. The vagina resembles a bottle, and the uterine portion is like a head and neck. This is in the female which has never been fecundated. But during the period of gestation the womb is almost incredibly augmented in size, and never afterwards resumes either its identical form or virgin state of contraction.
- g, g.* The ovaries. These are two egg-shaped bodies, situated a little further forward than the fallopian tubes, within the cavity of the abdomen. They are the female testicles, and are about the size of walnuts.

- h.* Part of the rectum.
- i, i.* The diaphragm.
- k.* The bladder, distended with urine to show its dimensions and form.
- l.* The gall-duct.
- m.* The duodenum takes its rise from the right extremity of the stomach—being the first of the small intestines—and soon after forms a curvature around the head of the pancreas, having the liver above and the great arch of the colon below it. When it reaches the concave part of the liver, it makes a sudden turn backward, and becomes attached to the right kidney ; then crosses the spine, between the roots of the mesentery and mesocolon and left side, where it assumes the name of jejunum. The duodenum receives the food which has been converted into chyme by the digestive power of the stomach, and in this gut is converted into chyle. It is mixed with the bile and the secretion from the pancreas, which enter into this intestine about five inches down from its origin. The bile appears to be the principal agent in this change, for no sooner does it enter into combination with the chyme, than the fluid begins to separate into two distinct ingredients, namely, the thick white liquid termed chyle—which is the nutritive portion of the food—and a yellow pulpy substance, which becomes excrement. A more perfect separation of these substances takes place further on in the intestines, the chyle is sucked up by the mouths of the numerous small vessels called the lacteals, leaving the excrement alone.

The next part of the small intestine which follows the duodenum is the jejunum, through which the food passes with great rapidity, for it is generally found quite empty in the dead subject. It is paler in colour and less in calibre, and also much longer than the duodenum,

The next intestine is the ileum, which is the longest of all the intestines, and forms the greater part of the convoluted tube, which lies chiefly in the umbilical region. The small intestines altogether will contain about eleven gallons of fluid.

That part of the food which has not been taken up by the lacteals and absorbents in its course through the small intestines, passes through the valvular opening of the ileum, the fluid portion of it finds its way into the colon, and the rest enters into the cæcum. Here it seems to remain a considerable time, in order that the nutriment may be extracted from it. This blind pouch is plentifully supplied with bloodvessels and absorbents, which perform their office of carrying off the nutritive portion.

Horses will frequently drink more at a time than the stomach is capable of containing. It does not, however, remain in it, but passes on to the cæcum, which acts as a reservoir in time of need. This organ will contain four gallons of fluid.

n, n, n. The aorta descends in both cavities.

o. The vena cava descends.

p, p. The emulgent veins, which empty their blood into the vena cava.

q, q. The emulgent arteries, emanating from the aorta.

r, r. The spermatic arteries and veins, which are united by a cellular substance, soon after their origin is distributed to the ovaria.

s, s. The ureters, which have their origin in the kidneys, and are inserted into the upper part of the bladder.

t, t. The iliac vessels, which are bifurcations of the aorta and vena cava.



CHAPTER XI.

OF THE SKIN AND ITS DISEASES.

The skin of the horse consists of three parts, differing in appearance from each other, namely, the cutis, or true

skin ; the cuticle, epidermis, or scarf-skin ; and the rete-mucosum.

THE CUTICLE

Is placed externally ; it is very thin and somewhat transparent and tough. In the living animal this may be proved by application of a blister : serum is effused from the exhalents of the cutis, and the cuticle becomes elevated by it in the form of small pellucid bladders. This membrane is continually growing, and the scales which are brushed out in grooming are scaly portions of the cuticle.

The cuticle seems to be composed of very thin flexible scales, somewhat resembling the scales of a fish, and similar to them in arrangement. The cuticle is produced by the true skin, and is perforated by both its exhalent and absorbent pores. In almost all parts of the body the cuticle is thickly clothed with hair, but that of the nose, the lips, and the interior of the ear, the borders of the eyelids, and the inside of the superior portion of the thighs, is naked ; and in all those places is thinner in substance than on the other parts, which are invested with hair. The colour of the cuticle is the same in all horses, whatever be their hue. But it is a known fact that the skin of the silver grey Arabian horse is of a bluish black ; but whether this colour is in the cuticle or in the rete-mucosum I have not yet been enabled to discover.

The epidermis is everywhere perforated by minute holes, corresponding in situation, size, and number to those of the cutis. First, there are the pores for the hairs ; secondly, the perspiratory, or exhalent pores ; thirdly, the absorbent, or inhalent pores ; and lastly, larger-sized pores, through which unctuous secretions in various parts are emitted. The cuticle is destitute of both nerves and vessels, and consequently devoid of sensibility.

THE CUTIS.

This is the true skin, or that portion which is converted into leather, and lies immediately under the scarf-skin. It reaches over every part of the animal. It is attached to the under parts by the cellular membrane, and in some places fits so tensely that it is incapable of motion of any kind. In other situations it is more loose and can be pulled into folds ; about the forehead, the back, and near the hock and pasterns, it is so tightly braced that it is hardly possible to pinch up a part of it between the finger and thumb ; upon the sides of the face, neck, ribs, along the flanks, front of the chest, and upon the arms and thighs, it is more easily folded. In the blood-horse it is thin and highly sensitive ; while in the cart-horse, it is much thicker, and far less sensible ; and is liable to considerable variation in different breeds. The texture of the hair seems to depend in a great measure upon that of the cutis, for we find that of the thick-skinned black horse much coarser than in the racer and other high-bred varieties. It is a rare thing to meet with a black thoroughbred horse.

The skin is beautifully adapted for giving strength as well as a protection to the muscles ; for we find in those parts that require to be firmly bound together, such as the bones of the knees, the pasterns and tendons of the limbs, it adheres with such tenacity that it cannot be raised from those places ; thus acting the part of a powerful ligature to the parts which are subjected to the greatest degree of stress ; and in those situations where being tight would interfere with the action of the horse, it is loose.

The cutis is of a strong fibrous texture, very tough, yet supple, elastic, very vascular, and sensitive. Its fibres are curiously interwoven in almost every direction, and so inter-

laced as to give great strength to its texture, making it almost impenetrable by a knife in the living animal, and possessing extreme elasticity. It is this quality which adapts it so closely to the animal, whether he is plump and muscular, or reduced to skin and bone. In man, and most other animals, where from disease a great reduction of the muscular fibre has taken place, the skin becomes loose and shrivelled. It owes this great elasticity to the innumerable larger and smaller glands which penetrate its entire substance, and furnish that unctuous matter, preserving the skin soft and pliable, and maintains that greasy moisture which its surface ever possesses, giving that beautiful sleek appearance to the hair. When the animal gets out of condition, and the skin is diseased, then the coat assumes a rough appearance, the hairs refuse to lie down, and it is then said that the coat stares.

The skin at the bend of the knee and hock is bountifully supplied with this mucous matter to give them suppleness, and to preserve from friction those parts which are subjected to such constant and active movements. Sometimes this secretion exceeds the quantity necessary for the due action of the parts, and from want of attention and cleanliness becomes inspissated, and collects about those parts ; and, if this hardness is permitted to remain, it will become a watery sore, which will terminate in lameness, stiffness, and pain in the joint when the animal bends it. When this is situated in the bend of the knee, it is termed mallenders, and when it is seated in front of the hock-joint, it is called sallenders, complaints which we have described at page 132. If these complaints are attended to in their early stage, nothing more will be required than to cleanse the part from the scurf or scab which it produces by soaking it in hot water, and carefully washing it every day with a sponge and

some astringent mixed with the water, such as a small portion of vinegar.

The skin of the heel has numerous glandular pores, through which the unctuous secretion oozes ; and sometimes these are unduly excited, and this matter becomes altered in its substance and odour, and produces that disease called grease, described at page 144, and which in some instances proves somewhat difficult to cure.

The cutis, when destroyed by any means, does not regenerate quickly. Great care should therefore be taken not to allow any portion of it to be broken. Many think that it is of little consequence for horses to have the skin of their back rubbed off by friction from a saddle. Such parts as have lost their cutis have it but slowly reproduced ; and even when it has been restored, its vital power is much weaker than it originally was ; for, although it appears at first to be very vascular, its vessels after a time either shrink in calibre, or some of them become altogether obliterated. It invariably happens that when horses have had fistulæ or saddle-galls, they are always more disposed to subsequent injury in those parts.

THE RETE MUCOSUM.

The third part of the skin consists of a membrane which bears this name ; it is a fine, delicate, laminated tissue, interposed between the cutis and the cuticle. The skin takes its colour from this membrane. It is from this membrane being black in the negro that he takes his dark colour ; for dissection has proved that his cuticle when separated from this membrane is as white as that of a European. Its use appears to afford protection to the delicate vessels of the nerves from outward injuries.

PORES OF THE SKIN.

The skin exhibits an infinity of pores over its entire surface, and probably the whole of these transmit hairs. There are also numerous others, smaller and less perceptible, which are called 'perspiratory pores, from their emitting an imperceptible vapour, denominated the *insensible* perspiration, the *sensible* perspiration being what is ordinarily called sweat. The situation of these pores is rendered manifest by the condensation and collection of this exhalation. But these pores can be rendered visible by maceration, or putrefaction in the dead animal. Besides these there is another set of pores, of larger dimensions, more discernible than others in some places, which are the mouths of follicles. These are of large size in the nose, for the secretion of mucus; and the tubes of the ears have many of them for the passage of the waxy matter; and all the portions of the skin which are liable to friction are numerously provided with them, which preserves it in a soft and pliable condition, and produces that greasiness of feel which is constantly kept up in the skin.

This process of perspiration in the horse cannot be so controlled by the use of medicine as in the human being. The visible perspiration can only be increased in a limited degree in the horse, although we can in some measure lessen profuse perspirations which accompany the moult, disease or want of condition.

The visible perspiration, as far as we know, cannot be produced by any kind of medicine. Antimony and sulphur, however, have considerable effect in opening the pores, and and in a certain degree exciting the vessels to action.

There can be little doubt but the skin is furnished with absorbent vessels, which take in any substance in a fluid

state and conduct it into the circulation. We have strong proofs of this in the horse being more easily salivated than man himself, as we have known a horse to be salivated by rubbing a splint with mercurial ointment.

OF THE HAIR.

The hair of the horse is of two qualities : the one covering the entire surface of the skin, called its coat, and which is of a fine soft material ; and the other, which invests the ridge of the neck, crown of the head, and forms the tail, of a coarser texture, and much lengthened. The foretop appears only formed as an ornament ; while the mane is a protection to the neck during combat ; and the tail acts the double purpose of an ornament, and as a switch to drive off insects from its rear. The tufts of hair springing from the fetlocks defend them from contusion, and also protects the heels. The coat is of a uniform thickness all over the body, excepting upon the inner parts of the thighs, under the arms, &c. The coat varies in quality, colour, and length in different breeds. The thoroughbred racer, the Arabian, Barbs, and Turkish horses are remarkable for the shortness and sleekness of their coat ; while the cart-horse, the Shetland pony, and horses of all northern climates, are distinguished by the length, roughness, and coarseness of their hair. The lighter the shade of colour, the finer the hair ; and it has been found that in the chestnut and light bay horses there are many more hairs in a square inch than in black and other dark-coloured horses.

The coat is shed twice a year, in spring and autumn. In a state of nature this commences with great regularity as to time ; but in a state of domestication, this process is much influenced by the temperature and stable management. The hair of the mane and tail is never shed. Regeneration

of the hair is attended with a considerable expenditure of nervous energy, and consequently the strength of the animal during this process is affected, as well as his general health. The horse at this time feels a general languor, and consequently should not be subjected to violent exercise or hard work. This weakness will invariably be manifested by profuse perspiration when at work. Hard labour at these periods frequently induces various complaints.

To facilitate the process of moulting, or changing the coat, spices and other stimulants have been given to horses, which no doubt has the effect of hastening the change; but we would prefer allowing nature to pursue its own course, as there can be little doubt but these stimulants induce a higher degree of fever at the time, and may bring on a regular febrile attack. Gentle friction will be beneficial; but care should be taken not to abuse this. The curry-comb should not be used at this time, the brush only should be had recourse to, and that applied with caution. Moderate exercise and warmer clothing ought to be adopted during the biannual moult.

The slightest attention to the subject will easily convince any one of the altered state of an animal during shedding the hair. It will be found that at this time there is always an increased pulse, redness of the nose, and heat of the mouth, unusual in the healthy condition. Hence it is evident that everything exciting should be avoided. Many grooms are in the habit of giving the animal cordials and stimulants, mistaking fibrile excitement for debility. The following alterative will be found beneficial :—

Digitalis	.	.	.	1	drachm,
Nitre	.	.	.	2½	drachms,
Emetic tartar	.	.	.	1	drachm,
Aloes	.	.	.	1½	drachm.

The stable-clothing should be warmer, the usual quantity of food should be diminished, and bran-mashes given instead of hard food.

CLIPPING.

It is an utter absurdity to denude the animal of its natural quantity of clothing. It has been a practice to clip hunters, so that the coat of the animal may sooner dry after a long run ; but there is less danger to be apprehended from the longer coat, although it does not thoroughly dry, than when the short hair of the clipped animal exposes the overheated skin to the chilling effects of a frosty atmosphere, and thus during pauses from exercise the horse must suffer severely from cold, and besides is liable to be attacked by inflammation.

I am aware that many persons of much experience will differ with me in what I have said upon this subject. Waiving my objections, it must be admitted that the skin of the animal will dry much sooner after hard labour when he has a thin coat, and undoubtedly much labour will be saved to the groom, which is of material consequence. It has been said that horses which have short hair feed much sooner after a hard run than those which have a long and rough coat ; and then when once it is dried, there is less chance of its afterwards breaking out into a sweat.

SINGEING.

Many approve and recommend this operation, and by a little practice it can be singed nearly as close as in clipping. The instrument used is a piece of iron, about four inches wide at the extremity, made in the form of a Dutch-hoe, and inserted into a handle six or eight inches long. Some wick-cotton must be rolled round the bar at the bottom of

the instrument as evenly as possible. It must then be dipped in naphtha and lighted, and drawn gently over the coat of the horse, taking care not to go too deep at once, but repeating it frequently until the hair be burnt as close to the skin as possible. During this operation a blunt table-knife must be held in the left hand, with which to scrape out the flame from time to time, to prevent it burning too deep in any part, as well as to preserve the skin from being blistered. The singed hair must always be scraped carefully off before the flame be re-applied. The same part should not be singed several times in succession without allowing it to cool thoroughly, otherwise great irritation and fever may be induced. In singeing the neck, the mane must be turned to the opposite side to that which it is intended to burn, and a wet brush should be passed over the roots of it, to prevent the flame running over it. We would recommend that the operation of singeing should not be done all at one time, but by degrees on several successive days.

COLOUR OF THE HAIR.

Fashion too frequently regulates the prevailing colour of horses, because, as we have already observed, the colour of the coat is dependent upon chemical action, and consequently the constitution of the animal is connected with it. It will be found that there is also a sympathy between the colour of the hair and that of the eyes. The three primitive colours in the horse are white, red, and black ; and all the intermediate shades are modifications of these. Milk-white horses have very often wall-eyes, while blacks have dark hazel, and chestnut brown, varying in intensity with the depth of colour.

Black horses have in general excellent constitutions. In

Lincolnshire much attention has been paid to the purity of their large and stately blacks. They are peculiarly well adapted for waggons and other heavy machines, but are defective in point of activity. In the above and adjoining counties considerable attention has been devoted to a smaller breed of blacks, for the purpose of cavalry horses. They are remarkable for their high action, a quality which, however valuable in a draught-horse, is objectionable in a roadster, their paces being disagreeable. Few racers or hunters of character have been known of this colour.

Of all the colours, bays have been the best in this country. They are liable to many modifications of shade. Those which have no white about them, and whose limbs are black from the knees and the hocks to the feet, are the most desirable to possess, having in general good constitutions, and also well-formed feet. When they verge into the bay-brown, they are not so showy, nor is their action so good; but they will be found to be hardy, durable, and useful. They possess more substance than the lighter coloured bays, and have a greater depth of leg. If they happen to be high-bred, they will generally turn out good.

There are three varieties of chestnuts. The lightest red, which is denominated sorrel, have too frequently white about either their feet or face. In general they are found to be light in the carcase, and possessing delicate constitutions, and for the most part are hot-tempered. Many of them, although light in the figure and tolerably well formed, are nevertheless totally devoid of good breeding, and certainly incapable of endurance. If we have a predilection for chestnut, which is undoubtedly a showy colour, we must look to the lighter coloured horses with less of the red, and tending more to the bay or brown. The action of these horses is generally pleasant, but sometimes possessing irri-

table tempers. They are, however, considered rather constitutionally weak. The dark chestnut possesses a finely-moulded form, with well-rounded quarters, although the legs have a tendency to be rather fine. This horse is capable of great endurance, and possesses a healthy constitution. His temper will be found fiery and high. Small feet are frequently met with accompanying this colour, and which are generally disposed to contraction.

Snow-white horses are now seldom to be met with, although at one time they were very common; I mean, those which are white in their earliest years; as light grey animals soon become white, especially those which have dark-coloured joints.

The silver-grey is now not common, but they are in general high-bred, and of undoubted descent from the Arabian or Barb. Their height seldom exceeds fourteen and a half hands; (which is the ordinary size of their progenitors;) with a well-rounded body, firmly knit, light legs, oblique pasterns, and high shoulders. They are active and fleet, fitted for hard work, and possessing excellent health. Their action and appearance peculiarly fit them for the use of the ladies.

The iron-grey is a larger horse than the above, generally higher in the withers, with a thinner body, flatter chest, and more angular in all his proportions, with his legs often too long. They are showy horses, and well adapted for a carriage. In some instances they make good hunters, and are useful as roadsters, being capable of greater endurance than would be expected from the flatness of their chests. They are, however, found often to have a tendency to contraction of the feet, and hence lameness.

The dappled grey is usually a well-formed and active horse, and divested of all the angular points which charac-

terize the iron-grey. They look remarkably well in harness, and are showy as hackneys. When these horses are high-bred, which is mostly the case, they are not only handsome, but also active. If they are dark-coloured when young, they seldom or never become white, but retain their dappling and fine rusty colour for life. Formerly, this breed were heavy animals, but their form has been materially improved by the admixture of foreign blood.

The dun is a hardy kind, and especially if it is of the smaller or galloway size. Some of the best hackneys which I have known were of this colour. If of the paler dun, they are particularly well adapted for the phaeton of a lady. I have seen duns with a good deal of blood possessing very great activity. It is, however, curious that the larger horses of this colour, unless high-bred, are conspicuous for their want of action.

Roans, although frequently showy animals, are not remarkable for activity nor for constitution. Their delicate habits seem to give them an elasticity of joint which renders their paces easy, and they are therefore well adapted for ladies. This variety is very apt to have white legs and feet, and they are too frequently weak in consequence.

The cream-coloured steeds are a breed originally imported from Hanover, where they have for a very long period been bred as horses for the royal stud. There is a marked peculiarity in this breed: possessing a large yet perfectly well-formed carcass, with a beautifully arched crest, the action is graceful and dignified, which peculiarly fits them for the state-carriage of a monarch. The pupil of these horses is red, and the eyeball or iris white, so that they are true albinos. Their constitution is delicate, and they are incapable of great exertion and endurance.

The pied horse is in many instances an attractive animal, although seldom used as a riding-horse. If more than half-bred and well matched, they are showy in a carriage. They are, however, liable to have white legs and feet, points not desirable in any horse.

HIDE-BOUND.

SYMPTOMS.—This complaint consists of an alteration in the substance of the skin, proceeding from a hardness and unyieldingness of texture, in consequence of the want of the ordinary oily secretion on its surface, as well as in its whole parts. The skin to the touch has a dry and rigid feel, which proceeds from a want of energy in the vessels of the skin, rendering them unfit to perform their functions, and indeed in the vessels of the stomach and bowels, which must affect those of the whole system.

This rigidity of the cuticle naturally causes a dryness in the scales which cover it; and these being separated in all directions, turn the hairs in that irregular manner, and produce the rough, uneven coat, which is termed staring, always indicating a want of condition in the animal. This complaint may rather be considered as the concomitant of disease, than the ailment itself; for the root of the evil is seated in the stomach and bowels. This being the case, we must apply the remedy to the seat of the disease, as well as to the skin itself.

CAUSE.—This state of the skin accompanies various complaints, consequently the first thing we must look to is to discover its cause. Farcy, founder, chronic cough, grease, and glanders, when they have assumed the constitutional character, are all accompanied by an impaired state of the digestive organs; and to them our first remedies must be applied; and so soon as the cause is removed the skin

will be restored to its natural healthy condition and appearance.

REMEDIES.—If the complaint is connected with any of the maladies to which we have referred, then the medical treatment already recommended in these must be adopted; but if we are unable to detect the cause, which is frequently the case, it may then be suspected that it is connected with the suspension of some important secretion, and with the alimentary canal generally. Then we should administer some mild purgatives, which may consist of the following prescription :—

Aloes	.	.	.	1½ drachm,
Nitre	.	.	.	2 drachms;

made into a ball with treacle.

Let the above be twice repeated, and on the third day the following should be given :—

Calomel	.	.	.	1 drachm,
Aloes	.	.	.	2 drachms.

The horse should be kept from dry food, and in its stead give him bran and other mashes. This treatment must be pursued until a regular and healthy action of the alimentary canal is re-established, which will be indicated by the appearance of his coat. Some veterinarians recommend the following purgative in hide-bound cases.

Levigated antimony	.	.	.	2 drachms,
Nitre	.	.	.	3 drachms,
Sulphur	.	.	.	4 drachms;

made into a ball.

This is repeated every night, and accompanied by mashes until a healthy condition is established. Perhaps it is better to vary these different medicines. Sulphur and antimony combined produce a peculiar effect upon the skin,

while the sulphur acts upon the bowels, and the urinary organs are cleared out by the nitre.

If the horse is off his feed, and no symptoms of fever, it may be apprehended, as above hinted, that a want of energy of the vessels is the cause of the complaint. In that case it will be necessary to add a tonic to the above prescription. Let that be

Gentian	.	.	.	1 drachm,
Ground ginger	.	.	.	$\frac{1}{2}$ drachm.

But it is only in cases where it is evident that there is a want of energy that tonics should be resorted to, as they are apt to induce fever if too much used ; and although they may be useful, and attended with truly beneficial effects, when they are used with caution, yet the too frequent use of them induces a habit, and the quantity must be increased and often repeated, and a dangerous state of excitement is thereby kept up.

Besides what we have above recommended, it will be found that friction may be advantageously employed, as it arouses the dormant energies of the secreting vessels. Additional clothing may also be resorted to with great advantage. We must, however, draw a marked distinction between heat thus employed from that of keeping the stable warm. This is too frequently resorted to by injudicious grooms, who thus contaminate the atmosphere of the stable, and keep up what is very often the cause of the disease. Nothing is of so much consequence as a well-aired stable ; and if warmth is necessary, let it be applied in the shape of clothing.

SURFEIT.

SYMPTOMS.—In the spring large pimples or lumps suddenly make their appearance on the skin of the horse.

They differ materially in their effects, as some are attended with much itching, and others seem to give the animal no uneasiness whatever. Instances occur in which they disappear as suddenly as they came. When they do remain, in a few days the epidermis peels off, leaving a small scale-like spot, which is rarely a sore. In some instances these lumps are confined to the neck ; but more frequently they extend over the back, loins, and quarters.

CAUSE.—The true cause of this cutaneous disease is not known, although it has been called surfeit, from a supposed resemblance to those eruptions in the skin of the human being which follow unwholesome or indigestible food. This complaint, however, most frequently exists after or during the time the horse is shedding his hair, and at which period there exists a stronger tendency to stomach-affections, and consequently indigestion has been supposed to affect the skin in the manner described. Poisonous substances taken into the stomach, such as herbs and mow-burnt hay, the chemical qualities, in the latter case, having changed its properties, have been known to cause this eruption. Drinking cold water in immoderate quantity, as well as improper exposure to cold air when the animal was over-heated, have been known to induce affections of this kind. There can be little doubt but it is caused by some obstruction of the pores of the skin, which produces swellings around them, and depending upon a primary affection of the cuticle, or from a sympathy with the digestive organs.

REMEDIES.—The first thing to be adopted for the relief of this disease is bleeding. The extent of the complaint and the strength of the animal, and degree of fever, must regulate the quantity, which may be from three to five quarts. The following alterative must then be administered :—

Levigated antimony	.	2 $\frac{1}{4}$	drachms,
Purified nitre	.	3	drachms,
Sulphur	.	4	drachms ;

given at night, either in a mash, or formed into a ball with the ordinary substances ; to be repeated for several nights in succession, with the use of warm clothing, which, together with heat of the stable, will cause the sulphur and antimony to act with more effect upon the skin. His drink should be slightly heated, and a moderate quantity of green meat should be given him, if it can be procured at the time. In the mornings he should be walked out for half-an-hour, but his clothing must be warmer than usual. His food must consist of mashes.

It sometimes happens that the eruption will disappear immediately after bleeding ; but great care must be taken, in this case, to prevent exposure of the animal to cold, as without that precaution a fresh eruption is most likely to follow. If, however, an alternation of the pimples and lumps does take place, and the epidermis and hair begin to fall off in larger patches, then there is reason to apprehend that the disorder will terminate in mange, a complaint of a more serious character than that of which we are now treating. Bleeding has seldom to be twice resorted to in surfeit.

Physic must not be given in cases of surfeit, as it has been found to aggravate rather than alleviate the complaint ; because if connected with an unhealthy or irritated condition of the stomach and bowels, a purgative is certain to increase it.

MANGE.

SYMPTOMS.—This complaint is nearly allied to surfeit, and may be mistaken for it. It consists of a pimpled lumpy

eruption, pervading the same parts of the skin as in surfeit, commencing, however, on the neck, at the root of the mane. Some time after these lumps have appeared, a vesicle is formed on the surface of each, which in time breaks, and then the hair and cuticle fall off, leaving bare spots covered with scurf, from beneath which a foetid fluid issues, and then the scurf changes to a scab, which also soon peels off, leaving a larger bare space. This in some instances is followed by another scab; but more frequently there is left after the first scab peels off, a bare greasy-feeling spot, which is followed by a thickening of the skin, accompanied by tenderness and itchiness; this soon becomes puckered and folded to a greater or less degree.

As above noticed, this complaint commences on the neck, and its earliest stage may be observed before the eruption has come out, by the horse exhibiting symptoms of itchiness in the neck, and rubbing it against the different parts of the stall. To ascertain if it is this disease coming on, let the hairs of the mane be pulled, and it will be found that they are plucked out with ease. The disease generally creeps up the head, and downwards to the withers and back, and not unfrequently spreads over the entire body of the animal.

CAUSE.—A chief cause for this complaint is a general want of cleanliness in dressing the animal, as well as keeping the stable free from noxious vapours, which being inhaled into the lungs, carry contamination through the system generally. It may also be brought on by poverty of living, which is manifested by the complaint so often appearing in horses that have been half-starved, and otherwise ill kept. Many breeders are so parsimonious that they turn out their colts into a straw-yard, which they keep scantily supplied, without considering the damage they are

doing to the poor animals, and rendering them weak and useless for life. Their limited supply of food weakens all their digestive functions, which no after feeding can possibly restore.

It has often been found that a severe surfeit which has been neglected ends in mange. Contagion is also a fruitful cause of the complaint, as there is no malady with which the horse is afflicted more highly contagious than this. It appears to be communicated by the very slightest contact; and if it breaks out in a stable where there are other horses, generally attacks them all, if they are not speedily removed. Grooms should be very careful not to use the same currycomb to a diseased and to a healthy horse indiscriminately, neither should the same brush be used.

REMEDIES.—Bleeding is serviceable in mange, that is, if it proceeds from surfeit, contagion, or other circumstances, when the animal is in good condition; but if it is the result of poverty, or if the animal is low in flesh, it must on no account be resorted to, as it will rather increase than diminish the complaint. Physic is also indispensably necessary. It has been found that mercury is a useful medicine in mange; although internal remedies alone will never remove the complaint: an external application must be had recourse to.

If mange is not severe in its earlier stages, the following will generally remove the complaint:—

Barbadoes aloes	.	.	1½ drachm,
Calomel	.	.	1 drachm;

to be given in the form of a ball, mixed with a little lintseed-meal and treacle. Afterwards the skin of the animal must be rubbed with the following composition:—

Sulphur, in powder	.	.	.	1 ounce,
Train-oil	.	.	.	1 ounce,
Turpentine	.	.	.	$\frac{1}{2}$ ounce ;

and if the disease is obstinate, one quarter of an ounce of mercury may be added to it. The horse should be well rubbed down with a hard brush, and the scurf removed as far as possible. In some cases a currycomb may be first used to loosen the scurf. A strong solution of soap and water should be made, and all the parts affected thoroughly washed with a sponge, and then well dried. The ointment should then be well rubbed in with a piece of flannel, until none is left on the surface. This to be repeated daily until the skin assumes a healthy appearance. During the application of the ointment, an alterative ball should be daily administered, such as we have recommended at page 302.

When the above treatment has been continued for several days, and there is no visible signs of an amendment, then stronger means must be resorted to. The following ointment must be prepared, and the parts daily washed with it :—

Sulphur	.	.	.	$\frac{1}{2}$ pound,
Oil of tar	.	.	.	1 pint.

Every fifth or sixth day the ointment should be washed off with spirit of turpentine, and afterwards well cleansed with soap and water, which will enable the groom to see what progress has been effected towards a cure. But should the disease still continue, the application must be still proceeded with. Mange often proves extremely obstinate, and weeks of trouble have been required to restore the skin to a healthy condition. In the various washings the soap and water should be pretty warm, as this will have the effect of opening the pores, which is of material consequence while

the animal is undergoing anointment. When the horse has been thoroughly rubbed with the above, there is no danger to be apprehended of his affecting other horses in the same stable or field.

While the animal is subjected to this treatment, his food should be plentiful and nourishing, but not of stimulating quality. If during warm summer weather, he should be turned out to graze ; but if the weather is cold, he should be plentifully supplied with green food.

Sometimes this complaint is deceptive in its appearance, and seems better than it really is after the above treatment. Therefore, to guard against a return of it, the rubbing should be continued for three or four days after it is apparently well. The alterative medicine should also be continued for ten or twelve days after a cure has been effected.

It is hardly necessary to say that the clothing which the animal wore during the use of those remedial means must be thoroughly cleansed. To render infection impossible, they should be first soaked in water, with the addition of a thirty-fifth or fortieth part of the saturated solution of chloride of lime, and afterwards well washed with soap and water. In short, every part of the harness, rack, manger, and partitions should be completely scrubbed with a strong solution of soda and water ; and when dry, with a solution of chloride of lime, in the proportion of a pint to three gallons of water. The currycomb should also be well cleaned, and the brush thrown away.

We would particularly caution all persons possessing horses to be watchful of this disease ; and whenever they observe indications of itching in the head or neck of the animal to examine carefully if any symptoms of this disagreeable disease exist, and to attack it instantly. What we have already mentioned, namely, that in mange the

hair is easily plucked out, will at once determine if this is the cause of itching ; and it is always attended with a peculiar scurfiness of the skin, very different from that redness which is caused by an injury to the skin. But whenever there is any uncertainty respecting the complaint, the safest thing is to guard against its occurrence by taking a little blood, giving a purgative, and an alterative or two. It is quite possible for inflammation of the skin to merge into mange, unless guarded against.

WARTS.

These are excrescent tumours of various sizes which spring from the cuticle, and afterwards are based in the true skin. They infect various parts of the body, and sometimes are found in the prepuce and eyelids, or inside of the ears. These can only be removed by an operation, and that safely and effectually done by a practical veterinary surgeon. If the roots be very small, which is sometimes the case, they may be cut out close to the skin by a pair of small sharp-pointed scissors, and the part afterwards touched with caustic. If the stem of the wart be thick, it will not be prudent to cut it off, but a thread of fine waxed silk may be tied round it, and tightened every day until it drops off. Sometimes warts are in considerable clusters. When this is the case, it will be necessary to cut them off close to the skin, and afterwards sear the place with a red-hot iron, which will prevent them from growing again. If the horse is of a spirited nature, it will be necessary to cast him, to prevent kicking during the operation.

CHAPTER XII.

OPERATIONS.

ALTHOUGH operations are more the province of the veterinary surgeon than of private individuals, yet it would not be proper to pass over these without partially touching upon the subject. It is well for the untaught at least to know how the most simple of these are performed, and to them only shall we draw attention.

It is easy to imagine that in several operations the animals must suffer considerable pain, and under these are frequently very restiff. It therefore becomes necessary to have certain instruments constructed to restrain the animals, and prevent them from injuring themselves, as well as for the safety of the operator. These we shall describe in the first instance.

THE TRAVIS.—This machine, considered by Continental horse-shoeing blacksmiths as indispensable accompaniments to their forge, is comparatively rare in this country. On the Continent, even the quietest horses are shod in the travis. It consists of very strong bars of wood, between which the horse is confined and slung. Although this is well calculated to prevent danger to the blacksmith, yet many fine horses have been rendered useless from their violent resistance to such confinement.

THE BARNACLES.—These are the handles of the pincers, which are placed over and enclose the muzzle. These are compressed by the assistant in operations. They give great pain, but are indispensable with some horses to enforce

obedience. Sometimes this can be effected by blindfolding, but cannot be depended upon. Sometimes the use of the barnacles are ineffectual, which renders the side-line and twitch indispensable.

THE SIDE-LINE.—This is found useful in the operations of nicking, docking, and slight firing. It consists of the long line of the hobbles, or common cart-rope, with a noose at one end. This is fixed to one of the pasterns of a hind leg. The rope is then carried over the neck, and afterwards round the withers, and this is tied to that portion which comes from the leg. By drawing this leg forward, it renders him incapable of kicking with the other; and should he attempt to use his fore leg, the other may be seized and held up, which renders any exertion on his part nugatory. The above will be found effectual in all the more simple operations; and that even with restiff horses, if the assistants are determined and know how to restrain the animals. Sometimes the side-line is made so as to include both limbs, but in the struggles of the animal he is apt to throw himself, and may be injured in his fall.

For the more severe operations of firing and castration, improved hobbles are used. These permit of any single leg to be set at liberty and returned at pleasure; and when the operation is finished, all the legs may be freed from restraint in an instant. We need not describe the methods employed to throw a horse, because these are well known to the practical veterinarian, to whom alone operations which require this degree of restraint should be entrusted, and therefore we shall not touch upon them.

BLEEDING.

It is a too frequent practice for gentlemen who have given a little attention to the veterinary art, as well as with

some professional surgeons, to order a certain quantity of blood to be taken away, without themselves attending to the operation. Although we have pointed out the probable quantity under particular diseases, yet it must be distinctly understood that much depends upon the strength, size, and condition of the animal at the time ; and although we may suppose, from what we have seen effected by practice, that the quantity which we have ordered will suffice, yet in this we may be greatly mistaken. No regular surgeon, however great his practice may have been, can predict this to a certainty. We have already pointed out, at page 265 and the three which follow, the nature of the pulse and its different indications. Before bleeding, we are supposed to have ascertained the state of the pulse, and our object is to reduce it as nearly as possible to its natural, or healthy condition, or at least until a change has been effected in its action ; therefore, the operator or his assistant should keep his finger on the artery while the blood is flowing, and, without strictly adhering to the quantity which he had previously supposed, continue to take blood until a marked alteration in the pulse has taken place. Supposing it is for inflammation of the lungs, we must bleed until the *oppressed pulse* becomes fuller and more distinct ; or if in considerable fever, until the *strong pulse* beats softer, or the horse manifests symptoms of faintness.

The operation of bleeding is performed with a fleam, or lancet. We would recommend the former to be used by private individuals, or at least by such as have not had sufficient practice with the lancet. A piece of hard wood, loaded at one end with lead, called a *blood-stick*, is used for striking the fleam into the vein. Care should be taken not to strike too hard, as by doing so it is likely to wound the opposite side of the coating of the vein, which may produce

severe cases of inflammation. If the fleam is sharp, which it always should be, a blow with the doubled fist will answer the purpose of a blood-stick.

The jugular vein is the part usually selected for general bleeding. It is necessary to blindfold the horse, or to turn away his head from that side from which blood is to be taken. The hair is smoothed along the course of the vein with the finger, which has been previously moistened ; then with the third and little fingers of the left hand, in which the fleam must be held, sufficient pressure is applied to the vein so as to bring it completely into view, taking care, however, not to distend it too much, as the too rounded surface is apt to roll or slip when the blow is given to the fleam. The particular part from which the blood is taken lies about two inches below the union of the two branches of the jugular vein at the angle of the jaw. See plate iii. fig. 1, *p*. The fleam must be placed in a direct line with the course of the vein, and over the precise centre of the vein, with its point as close as possible to the skin, without touching the vein. A sharp but not heavy rap from the blood-stick or fist on the back of the fleam, directly over the blade, will cut through the coating of the vein, and the blood will immediately flow after the fleam is withdrawn. A large-bladed fleam should always be preferred, which will make a greater opening, and thus facilitate the operation ; besides, what is of greater importance, blood drawn speedily has far more effect on the system than double the quantity taken slowly ; and the wound, although larger, will heal as fast as a smaller one. A slight pressure on the neck with the pail, or other vessel used while blood is taken, will be enough to cause the blood to flow sufficiently fast. Some persons introduce the finger into the mouth between the tushes and the grinders, which by gently

moving it about induces motion in the jaws, and facilitates the rapidity of the stream by the action of the muscles in connexion with the vein.

In the operation of bleeding the blood should be received into a vessel the dimensions of which are exactly known, so that the operator may be able to judge from time to time of the quantity that has been taken. The blood ought also to flow in a regular stream into the centre of the vessel ; for if allowed to trickle down the edges it will, when cold, not exhibit those changes necessary for ascertaining the degree of inflammation. But to those accustomed to the pulse, it will form a better criterion when taken in connexion with the other symptoms. When it has been necessary to repeat the bleeding, if more than three or four hours have intervened, it will be better to make a fresh incision lower down than to open the old wound. The blood coagulates soon after it is drawn. That portion of it which is coagulable is composed of two substances—that which gives colour to the blood, and the thinner part in which the red particles float. By degrees these separate, and the red particles sink to the bottom. If coagulation takes place slowly, the red particles have more time to sink through the fluid portion, and there appears on the top a thick, adhesive, pale, yellowish orange substance, called the buffy coat. In proportion to the slowness of coagulation and the thickness of this coat, the degree of inflammation is determined. In the healthy condition, coagulation is more rapid, and consequently the red particles have not time to sink, and the buffy coat is thin. When the horse is much exhausted, and there is a general decay of his constitution, coagulation will not take place at all, but the blood will exhibit a uniform blackish colour, with a thin and loose consistence. When blood is drawn from a large orifice, coagulation is slower

and from a small wound it is more rapid ; so that the difference must be carefully considered, and the changed condition of the pulse attentively marked.

When the necessary quantity of blood has been taken, the edges of the wound must be brought close together and kept in their place by a small pin being passed through the contiguous skin, with a little tow, or a few hairs from the mane or tail of the horse, wrapped round the extremities of the pin so as to cover the entire wound. In bringing the edges of the wound together, care should be taken not to draw the skin too much from the neck, otherwise blood will insinuate itself between the skin and the muscles, and cause a swelling, which sometimes proves troublesome. The edges of the wound will heal in twenty-four hours, after which the pin may be withdrawn.

The jugular being the largest superficial vein, and most readily got at, is generally selected to bleed from ; and for affections of the head as well as extended inflammatory action and fever, is decidedly the best adapted. In local inflammation, blood may be taken from any of the nearest superficial veins. For example : in affections of the shoulder, fore leg, or foot, the plate-vein may be used, which lies along the inside of the arm, and runs up immediately in front of it towards the jugular vein. The disposition of this vein will be seen at plate vi. fig. 2, *r*, and the branches of the other veins of this portion of the limb are exhibited in the same figure. Where the hinder extremity is affected, blood is sometimes taken from the saphæna, or thigh-vein, which runs across the thigh. The course of the different veins of this part will be seen on referring to plate vii. fig. 2. Where the foot is at fault, blood should be taken from the coronet ; or, what is better, from the very point of the toe, by cutting down by means of a searcher at the

union between the crust and the sole until the blood flows. Should it not do so freely, the discharge may be increased by dipping the foot in warm water. Any quantity of blood may be taken from this situation, and its flow is easily stopped by putting a little tow in the cut, and then placing the shoe slightly over it, to prevent it from getting out.

In inflammatory cases, the finger of the veterinarian should never be off the artery during blood-letting, as this will be a better indication of the quantity necessary to be drawn than any preconceived opinion, as nothing can be more absurd than drawing blood indiscriminately. The prudent man will bleed until the oppressed pulse becomes more distinct and fallen, or the strong pulse of high fever softer.

We would recommend a sharp-pointed, broad-shouldered lancet, but especially the spring lancet, invented by Mr. Weiss, of London, as the most safe and certain one in use, not only for bleeding from the larger, but also the smaller veins, &c. We especially recommend great care in keeping the lancet clean, and after every operation it should be wiped very carefully. Private individuals should occasionally look at and rub their lancets, because they are apt to rust even when not in use.

In cases of inflammation of the brain it becomes necessary to open the temporal artery, to produce a sudden and plentiful flow of blood. No difficulty attends this, as the temporal artery lies superficially, about an inch and a half backwards from the upper anterior corner of the eye. The common lancet is best adapted for this operation.

BLISTERING.

We have already mentioned blistering in treating of the

various diseases to which it is applicable. Blisters act on the principle that two intense states of inflammation cannot exist in contiguous parts of the system at one time ; therefore we apply some acrimonious substance to the skin to induce external inflammation, to draw away that existing in some deeper contiguous parts. Upon this principle we apply a blister to the side in cases of inflammation of the lungs ; for inflammation of the bowels, we blister the belly ; the legs are blistered for that of the cellular substance surrounding the sheaths of the tendons ; and for inflammation of the navicular joint, we make the coronet or heel the medium of operations. Besides their use in inflammation, blisters are useful in increasing the activity of the vessels contiguous to the places where they are applied. In cases of strangles, for example, a blister is used to induce earlier suppuration. Such is the power of blisters, that they will excite the absorbents to greater energy, and by this means they will carry away tumours, and callous, and even bony substances.

In the application of blisters there is some nicety required to determine when a stronger or weaker one must be applied ; whether by long-continued, or sudden and violent action, the desired effect is most likely to be produced. In inflammatory cases, strong blisters will be found best ; but in old and long-seated tumours and swellings, milder means must be adopted.

It is necessary to prepare the skin of the horse for a blister, by clipping off or shaving closely all the hair of the part where it is to be applied. The best composition for a blister is Spanish flies, lard, and resin, in the proportions for which we have given a recipe at page 59. This should be thoroughly rubbed in, otherwise it will not rise. After the application of a blister the head of the horse must be tied up for at least two days, to prevent him from disfiguring

the part with his teeth, as well as injuring his muzzle. If, however, the sides are blistered, the clothes may be so fixed that he will be unable to reach the part. When the blistering ointment has remained on for twenty-four hours, the part may be rubbed with a little olive oil, which will assist in alleviating the pain, as well as in softening the skin and preventing it from cracking, which it is liable to do, and these become difficult to heal. The oil must be applied morning and evening to the part, until the scab falls off. When the scabs show symptoms of peeling, their removal may be facilitated by the application of a lotion of soap and water, applied with a sponge or piece of flannel ; but they must not be forced off, as by doing so a blemish will be left.

Some persons recommend the removal of all the litter and straw from the stall of the animal, if blistered on the belly or sides ; but we think this unnecessary, as it would be better to put additional clothing, or cover the part with something soft, well secured against being irritated by the straw. It would be as well to keep the horse standing for two days, taking care that he cannot reach the blistered part to blemish his skin, which will be best effected by what is called a cradle. This consists of round strips of wood attached together, extending from the lower jaw to the chest.

For a sweating blister the best application is an infusion of Spanish flies in turpentine, and that should be reduced to the proper strength with neats' foot oil, according to the degree of excitement required.

If the blister has not the effect of removing the disease, it may be repeated after the scab has been healed and removed from the old part.

Where inflammation is of a very dangerous and severe kind, very strong blisters must be immediately applied,

and these should be very large. If in the lungs, the blister should extend over the whole sides and greater part of the brisket. It sometimes occurs that absorption of a portion of the flies takes place, which produces strangury, or spasmodic inflammation of the neck of the bladder, and this, upon the principle of counter-irritation, will assist in allaying the more dangerous one. However, this must not be allowed to continue long, as it is of itself a most painful complaint. It will be necessary to supply the horse plentifully with lintseed-tea, made in the following proportions, until the complaint is abated, which will be known by the animal staling less frequently; as in inflammation of the bladder or its spincter, the animal stales very often, and that is voided in small quantities:—

Take a pound of lintseed a little bruised, and pour on it two gallons of boiling water, and allow it to stand until nearly cold; then pour off the clear mucilaginous fluid. This should be given to the animal in portions of a quart at a time every three hours. Half-a-pound of Epsom salts should be dissolved in a quart of water, and administered. Every six hours the following ball should be given:—

Opium	.	.	.	.	1 scruple,
Camphor	.	.	.	.	1 drachm;

made into a ball with lintseed-meal and treacle.

Mustard blisters have frequently been applied to horses with beneficial results, and produce even a greater degree of swelling than cantharides. Those are made by pouring boiling water on half-a-pound or a pound of good mustard powder, according to the dimensions required to be excited. It should be of the consistence of a thick paste. It has been found to relieve inflammation of the kidneys more rapidly and effectually than cantharides. Tincture of croton

makes an active liquid blister ; and for milder applications hartshorn has been used.

In treating of sprain of the back sinews, page 119, we recommended a blister in certain cases ; however, this must never be resorted to while any heat or tenderness remains about the places affected, as this would only increase the superficial inflammation, without allaying that which is more deeply seated, and might produce enlargements of the limb, and finally obstinate ulcerations, and thereby render the horse unfit for work. It is a mistake to suppose that blistering is beneficial in grease, as it rather increases than diminishes the complaint. Blistering in cold wintry weather must be done with great caution, because if the part should be exposed to cold it is very likely to end in grease. Blistering all round the limbs is not only a cruel but a dangerous practice, and ought never to be resorted to.

FIRING.

We cannot contemplate the use of firing without associating with it a degree of cruelty ; but in many cases it must be had recourse to as the only method of removing the complaint. The principle on which firing is adopted is by exciting some superficial parts, and thereby, by counter-irritation, relieving deeply-seated inflammatory action. This strong remedy has also the effect of exciting the absorbents to carry off bony matter which is apt to be secreted in the limbs. In short, it is the most powerful stimulating agent with which we are acquainted ; but should never be had recourse to, except when there is no chance of milder remedies being effectual.

When it becomes necessary to fire a part, the hair is clipped as close as possible, and afterwards shaved ; so that

the iron may come into immediate and close contact with the part, as also to prevent the smoke arising from singeing the hair, obscuring from sight the part requiring to be operated upon. It is absolutely necessary to throw the horse in operations of this kind, not only for his own safety, but also for that of the operator. And to prevent the animal from using violent exertions, the hobbles, mentioned at page 312, must be used ; otherwise there is danger of penetrating the skin, which ought never to be done in firing, otherwise inflammation and ulceration will ensue.

As this is an operation which ought never to be attempted but by a veterinary surgeon, we shall not descend to the details of how it is performed. The operation of firing requires both tact and skill ; and even with the best operators, accidents will occur to the horse, in consequence of his violent struggles, which it is impossible in some instances to prevent, and the skin will be unavoidably cut through with the iron ; but the accident cannot be fairly attributed to the surgeon. The skin thus partially divided is sure to separate in two or three days after the operation ; but the ulceration which follows will be slight and easily cured, when compared with the skin being actually burnt through with the iron, as this is sure to be followed by violent inflammation, ulceration, and sloughing, producing effects very difficult to cure, besides leaving unsightly blemishes, and in some cases rendering the horse useless.

It is the practice of some veterinary surgeons to blister after firing. This is a most unjustifiable procedure, unless in cases of large bony tumours, spavin with considerable lameness, and ring-bone investing the entire coronet, and in old and obstinate affections of the round-bone ; but in less serious complaints it is a piece of great cruelty.

The day after the operation of firing, the part should be

rubbed with lard, or, what is still better, neats'-foot oil. This will give a pliability to the skin, and render it less liable to separate or ulcerate; but if cracks or ulceration take place, then calamine ointment must be applied to it. The composition of this ointment will be found amongst the medicines, in the following chapter. A bandage must not be used, as it would prove injurious by irritating the part.

There can be little doubt of the superiority of firing over blistering. The skin being partially destroyed by the iron, is restored, and the surface lessened by its being drawn together, which acts as a kind of bandage, and consequently tightens and binds the whole parts; and by adding pressure is of much advantage in reducing hard and callous substances. After firing, it will be found of much advantage to turn out the animal to grass for three or four months. It is very unsafe to work a horse for a month or two after this operation, as it is likely to produce a fresh inflammation, which in all probability would be worse than the first.

Firing should always be either in parallel or longitudinal lines, particularly on the coronet, fetlock, and back sinews, for the reason that the skin will contract, so as to form the greatest uniformity of pressure.

NEUROTOMY, OR CUTTING THE NERVE.

The valuable services of the horse would be in a great degree circumscribed, but for the artificial protection of his hoofs by an iron shoe. Without this his feet would soon be battered to pieces going over our hard roads. But while shoes protect his flexible horny hoofs from injury, they at the same time cramp and confine them, from the inflexible nature of the iron and tight nailing, which, without great

care, lays the foundation of many diseases, and those too of a very painful description.

To alleviate to a certain extent the severity of those painful complaints, veterinary surgeons have adopted the practice of cutting the nerve which goes to the foot. This nerve has its origin in the union of several of the spinal nerves, and consequently is a nerve which gives both motion and feeling to the foot. The fibres, however, which are connected with motion, are carried only to those parts which are concerned in producing motion, and these are muscles. The influence of the nerves acting upon the muscles cause them to contract, and consequently the limbs are moved. The bones, blood-vessels, and other parts are merely passive agents. The muscles of the leg do not extend below the knee, and the fibres of the nerves concerned in motion are distributed above that joint, so that no part concerned in the production of motion extends below the knee; and when the nerve is divided either above the fetlock or on the pastern, not a fibre is touched concerned with motion, but those of feeling alone, and those are continued to the point of the toe. It will be seen therefore that this operation does not at all interfere with motion; but the sensibility or feeling of the foot is taken away, and the poor animal relieved from the torture which diseases of the foot generally cause. By this means the irritation of the foot is relieved, and this in most cases produces an abatement of the inflammation, and the horse will be able to perform work, and have the free use of his foot.

When horses have inflammatory diseases of the foot, they generally keep beating it on the ground, which not only keeps up the inflammation, but even increases it, while they frequently destroy the hoof by this constant battering.

Many persons have supposed that by cutting the nerve, the horse must lose its foot, but no such effect has ever been known to follow this operation. This nerve is connected with sensation alone ; those on which the nutrition of the foot depends are the ganglial nerves, which wind round the veins and arteries, even to their most minute branches, and enable them to perform their functions. These cannot be touched in the operation of destroying the nerve of sensation, nor will it in the slightest degree militate against the functions of nutrition.

I have given a representation of the parts connected with the operations of neurotomy, plate vi. fig. 7, and described these parts at page 245. It will be seen that the nerve is on the inside of the foot, as it approaches the fetlock and passes over the pastern, where it branches off above the fetlock. The prolongation of the nerve below the fetlock is extended principally to the quarters and hinder part of the foot, for the purpose of supplying it with feeling. Before operating for neurotomy, the seat of the disease which causes pain must be ascertained, which is indicated by the throbbing of the artery, or by the round firm feel of the nerve itself on the side of the shank-bone, or the larger pastern. In this situation the artery, vein, and nerve lie close together, and run in the same direction ; the vein is next to the fore part of the leg, then the artery, and the nerve behind. Before commencing the operation, the horse is cast and properly secured. Then remove the limb to be operated on from the hobbles. The hair must be shaved from the part. The skin is then cut through with great caution for an inch and a half in length, which will expose the vessels above referred to, and the nerve will be distinguished as occupying the position above pointed out, as well as from its whiteness. Pass a crooked needle with

a silk thread under it, raise it a small degree, and then dissect it from the cellular tissue beneath ; and when fairly felt, cut out about a quarter of an inch of it, making the first incision above, and the second cut will not be felt by the animal at all. The same must be performed on either side of the foot, as the nerves proceed down both sides. The sides of the wound are now brought together with a piece of adhesive plaster, and secured by a bandage. The head must then be tied up for a day or two. In less than a fortnight the horse will be fit for work.

The operation of cutting the nerve may also prove of service for ring-bone, where the side cartilages become ossified, with partial stiffness of the pastern and coffin-joints. They will be more liable to recover their usual action in consequence of the animal using the foot freely, as he will not feel pain while in motion. Neurotomy may also prove of much advantage in long-continued lameness, where no unusual heat is discoverable, nor contraction or alteration in its form can be perceived ; neither will the extremely acute pain caused by the pressure of the horny crust on the sensible parts be longer felt, and the animal will be able to place his foot firmly and fully upon the ground : all appearance of lameness will be removed, and the ultimate result will be a partial restoration at least of the form and elasticity of the foot.

The above are some of the benefits which will be derived from neurotomy ; but there are other cases where cutting the nerve would be attended with unfavourable results. When the pastern or coffin-joints are quite stiff and unyielding, if this operation were performed, the animal would naturally bring his foot to the ground with force, and the joints being divested of their natural elastic play, the bone would be still more injured. In inflammation or ulceration of the

cartilages and ligaments, it would be injudicious to cut the nerve, as the animal feeling no pain, the too active use of the foot would hasten the progress of disease by bruising the parts. Neither would it be proper to have recourse to neurotomy in pumiced and convex soles of the foot, because it would be speedily worn out and destroyed by the animal now pressing on it ; whereas before the operation the pain of pressure naturally induced him to bear lightly on it.

From what we have said, we hope all the prejudices against this operation will be removed, and by resorting to it many suffering cart and waggon horses will be freed from suffering, and prove more serviceable to their owners. But by all means let the nerve be cut by an experienced veterinary surgeon.

SETONS.

In abscesses, ulcers, and tumours, the use of setons will prove of great service. A seton is a piece of cord or tape passed through the base of such ulcers as have deep sinuses, or between the skin and muscles. This is effected by means of an instrument resembling a needle, and the seton is kept in its place by means of a knot at each end, or tying the ends together. The tape should be moved several times during the day, and wetted with turpentine, spirit of wine, or some acrid liquid, in order to keep up the inflammation and promote the discharge of matter, which is the purpose for which setons are use

Setons are often useful in increasing a discharge in the places contiguous to inflammation, and thus carrying off that superfluity of fluid matter which would distend the vessels of those parts and keep up the inflammation. For example : in inflammation of the eye, a seton in the cheek will act with much advantage, on the principle of counter-

irritation. In deep-seated inflammations many favourable results have been experienced in the use of setons. For example: in inflammation of the navicular-joint, great advantage has been derived from a seton, although the reverse is the case with frog-setons for all diseases of the foot. But where there is inflammation in the larger organs, we must not expect to reap great advantage, as their power of action is too limited. Where the chest or intestines are affected, a rowel or blister will be found far more effectual.

Where there are abscesses or tumours in the withers or poll, the seton should be passed entirely through from the bottom to the top, by which the fluid will be discharged and the accumulation of more prevented. They are especially valuable in deep fistulous sores, by giving an outlet to the matter secreted in them, which if not discharged would cut deeper into the parts, and without being thus worn off, the disease would never be extirpated.

DOCKING.

It has been a long-established custom to dock the tails of horses, convenience justifies it and fashion guides it. The length of the stump varies with the taste of the times, or the fancy of the owner. A medium length is undoubtedly the best, and a very short one is not only unseemly, but also a very great injury to the animal, as he is thus deprived of that which nature intended as a switch, and as a substitute for hands to drive off insects.

The operation of docking is performed at different ages of the animal; some consider it best to do it at two years, while others think the earlier the better. From what we have ourselves noticed, we coincide with the latter opinion. At a fortnight it may be done with perfect safety, and even

sooner ; and it unquestionably affects the foal less at this period than at the age of two years.

The manner of performing the operation is to fix upon a part of the tail, and having determined on that, take the one next joint to it ; let the hair be turned up and fastened with tape for an inch or two above the joint, while that which grows upon the vertebra itself must be cut off. The horse is then restrained by the side line, and the surgeon now applies his docking machine, and cuts it through at the division between the vertebræ at one stroke. It is not uncommon for farmers and other breeders to perform the operation with a sharp knife, resting the tail on a board, and striking the back of the knife with a mallet or hammer. Although considerable bleeding is caused by this operation, there is no danger to be apprehended from it. To stop this in the speediest manner is to sere the stump with a red-hot iron, with a hole in its centre to prevent it from touching the bone, which would cause exfoliation ; or, if severely injured, it would fall off at the joint above, and thus shorten the desired length of the tail. The bleeding vessels are all on the outside of the bone. The iron must not be too hot, nor much pressure applied to it, neither should it be long continued. No kind of dressing is required after this operation. In some cases slight bleeding occurs after the use of the cautery ; but when this occurs, it is better to allow it to stop of its own accord, as a repetition of the burning might cause locked-jaw, or constitutional irritation.

NICKING.

It is to be lamented that fashion has long held a sway in promoting and maintaining this cruel operation, even in its simplest form. However, of late, public taste has materially improved in this respect, for the fashion at the present day

is to have horses with long switch tails, possessing much of that beauty which nature wisely intended by the formation of that organ ; as also, like that of other quadrupeds, to assist him in turning when going at a rapid speed, as well as to defend him from the attacks of numerous insects with which he is constantly annoyed when in the field.

We wish we could pass over the subject of this barbarous operation without noticing how it is performed, but as there are still persons so devoid of taste and feeling as to approve of it, the work would be necessarily imperfect without a description of the operation.

We have given a figure of the skeleton of the horse, plate ii, and referred to it at page 189. It will be seen by a reference to these that the horse has eighteen dorsal vertebræ, or bones of the back or spine, extending from figs. 14 to 14 ; besides five lumbar in some subjects, and in others six, fig. 15, there is a continuation of these called the sacrum, which consist of five bones, which are separate in the colt, but which become consolidated in the adult animal. To the sacrum the bones of the upper and side portion of the haunch, or pelvis, are strongly articulated, so much so that they resemble a solid mass rather than a joint. From the lower or outer extremity of the sacrum, the bones of the tail emanate ; these are fifteen in number, extending from figs. 16 to 16, and gradually diminishing in size towards the point. The spinal-marrow extends to the extreme tip, as well as the continuation of the arteries of the sacrum. The setting on of the tail and its particular character and curvature from the loins is much looked to by those who are judges of horses, as from this they discover the purity or impurity of the breed. The line from the setting on of the tail ought to be almost straight, or with a slight inclination downwards, as there

is no surer test of a high-bred horse than this character of tail.

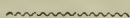
The tail has three sets of muscles, the one for raising it, plate vii. fig. 1, *e*, and another immediately below for depressing it, and a third for giving it lateral motion in every direction. When the animal is at rest, the power of the lateral set of muscles seems to predominate, as the tail is constantly inclined downwards, resting upon the buttocks; but when energised the tail is carried higher, which gives that spirited character to him when excited. It was to convey this expression constantly that the operation of nicking was devised; therefore the depressor and part of the lateral muscles are nicked through to a greater or lesser degree, as the wish of the operator may suggest to him, as to the height at which he wishes the animal to carry his tail.

The operation is performed in the following manner. The horse is cast, and the hair at the point of the tail firmly tied together, so that a weight may be afterwards attached to it. The tail is then held firmly in the hand and lifted up, and the exact central spot of one of the bones is ascertained, and the muscle is divided deep with a very sharp knife or scalpel from the edge of the tail to the centre, and continuing the incision across the bone of the tail, it is cut as deep as on the other side. All this may be done with one rapid and steady incision without lifting the scalpel. In a high-bred horse this will be sufficient for the purpose; for a hunter two incisions are usually made, the second being about two inches below the first, which should also be as near as possible to the centre of one of the vertebræ. In the hackney it has been the practice to make three cuts, so as to make him carry his tail still higher. Two cuts only are made in the tail of a mare, and the

second one is seldom deep. Any of the fibres which may reach across the incision must be cut off with a pair of curved scissors. Each incision must now be filled with pledgets of tow, and inserted deeply into the wounds ; and it must be distinctly ascertained whether the muscles are cut uniformly on each side, otherwise the animal will carry its tail awry. They must be secured by a bandage, but it must not be made too tight, as bad consequences are likely to follow where this is done. Indeed, if not loosened in the course of two or three hours, intense inflammation and swelling will ensue, and in all probability death may follow. In about twenty-four hours after the operation, the bandage may be thrown aside and the wounds kept clean, which is all that will be required.

The tail must be afterwards kept bent back for some weeks until the wounds are healed ; because if allowed to hang down, the edges of the cuts would come in contact and soon reunite again. This is accomplished by means of a cord from one to two feet in length, which is attached to the hair at the point of the tail, and this is affixed to another divided cord, each division passing over a pulley on either side of the back of the stall. To each extremity a weight is suspended, sufficient to keep the cuts of the tail open to the extent required ; but it is an act of cruelty to hang too heavy weights to these, as the smallest quantity beyond what is necessary inflicts great pain on the animal. Some persons do not use pulleys at all, but by keeping a slight girth on the horse, attach a cord to the tail and pull it backwards. However, whether the pulleys or simple cord are made use of, the tail must be relieved from the weight once or twice a day, and the horse exercised. Ten days or a fortnight will be required to complete the operation, as if too soon removed, the desired elevation of the tail may not be effected.

It sometimes happens that great irritation and inflammation take place in nicking, and even locked-jaw has been brought on by it. When the first of these ensue, the weight must be removed from the tail, and the parts carefully fomented with warm water, and gentle purgatives administered. When locked-jaw has taken place, the joints of the tail should be amputated at the first joint above the highest nick.



CHAPTER XIII.

OF BREEDING, FEEDING, AND TRAINING HORSES.

SECTION I.—BREEDING.

THE utmost attention should be paid in the selection of brood-mares, because the progeny depends more upon the dam than the horse, and the size and strength of the foal will bear a considerable similitude to hers. As a proof of this, we have found that those horses that have been the produce of an Arabian stallion and a mare, if she were large and well-formed, have not resembled the horse in their stature. Up to the year 1829, only one Arabian horse had been brought to Scotland, which was in the reign of Alexander I., who, in the year 1131, presented to the Church of St. Andrew's an Arabian horse, furnished with costly trappings; this is the first that was brought to Great Britain. In 1829, my late friend Capt. Horne, of the Madras Artillery, introduced a beautiful silver-grey horse, called the Humdanieh Arabian. His height was fourteen hands and a half—a size which the Edinburgh breeders

thought too small to be a good breeding stallion, and refused to use him as such. Sir Robert Keith Dick, Bart., however, who had been long in India, was well aware of the fallacy of size being an objection. He offered to keep him at Prestonfield and breed from him. The first colt of his produce turned out the largest that Sir Robert had ever bred. It is an established axiom, that in general the produce partakes of the qualities, or the mingled qualities of both parents. Above all things, avoid breeding from either a horse or mare which has any disease, as it is quite certain that the progeny will inherit it ; and like diseases in the human race, if it does not show itself in the first generation, it is more than probable it will break out in the second ; so that breeders should always know the history of both sire and dam. And we again repeat, that however perfect the form of the horse, these may be neutralized by a defective mare. Wherever bad points appear in either the male or female of animals the breeder is anxious to avoid, or, on the other hand, keep up, from possessing some good qualities and points, attention should be paid to put an animal of the opposite sex to the other having those points in a more perfect degree ; and it cannot be too strongly impressed upon the mind that excellence on the part of the mare is as essential as that of the horse : for it very rarely happens that a good foal is produced by a sorry mare

We see what has been effected in Yorkshire and other midland counties in breeding the larger-sized cart-horses, by a strict attention to have both sire and dam as perfect as possible in their form. Both parents should be in full possession of their health and strength ; and it is a great mistake to suppose that a mare can be fit for breeding when incapacitated for work. Many suppose that because a mare is rendered lame by accident, that she is nevertheless useful

as a brood-mare. This, however, is a great mistake, and should be carefully avoided.

Breeding in and in, as it is termed,—that is, forming a constant union of the same blood, is always attended with bad results. However good both sire and dam may be, if too closely allied, the progeny will in all probability turn out weak, and become liable to all those diseases to which delicate constitutions are subject ; but where parties have a predilection to a particular stock, these evil consequences may be obviated by occasionally introducing fresh blood, either by crossing with the sire or dam.

A good brood-mare should be selected with a rather long carcase, so as to give sufficient room for the growth of the foetus ; at the same time she should be compact in the make, and rather short than otherwise in the leg : while the stallion should be somewhat opposite in his form, which ought invariably to be short, with as many of the good points which we have before enumerated contained within a small compass. The inclination of the shoulder is also an essential point to be attended to. A large stallion with upright shoulders never got a good hunter or hackney ; but for a draught-horse, this form is desirable.

To secure a good and healthy progeny, youth on the side of both sexes is very essential. Both ought to be in the prime of life, and in full health. From three to four years of age is a proper time to commence breeding from a mare, but to begin sooner, before their form has assumed its full strength and vigour, cannot fail to produce very bad consequences. It rarely happens that mares bred from at an earlier period ever attain full vigour. Mares that are little worked, may be safely bred from, until they attain the age of eighteen or twenty, and instances have occurred where they produced splendid foals at the latter age. But, on the

contrary, if hard worked, there is little chance of the progeny being good.

The mare comes into heat early in the spring, and generally goes with foal for eleven months, although it not unfrequently happens that they vary, even so much as from a month to six weeks, either earlier or later. From the time which the mare is covered until she foals, she may be moderately worked with safety, and even with advantage to both parent and colt; but we would recommend for a week or two before foaling that she should not be worked, but subjected to regular daily and moderate exercise. The time can be pretty nearly guessed from the time she was covered. About a day before foaling an adhesive matter issues from the teats of the mare, and after this she should on no account be subjected to any sort of work, but allowed to go at large, and constantly watched by some careful person.

After the mare is about half advanced in pregnancy, she should be well fed, and from one to two feeds of oats given to her daily, as a greater quantity of nourishment after this period is required for the support of the foetus. If the system is allowed to become debilitated from want of a supply of food to meet the increased demand, then there is a probability that her weakness may lead to her proving abortive, to which mares are more liable at this period than either before or afterwards. There can be little doubt that good feeding and moderate exercise will be most conducive to the prevention of dropping a foetus; but after this time hard work must be avoided, and also galloping or hard trotting. Should a mare once prove abortive, it is extremely likely to happen afterwards. It is a curious fact that where two or three mares in foal are on the same pasture, if one is abortive, the rest are very liable to the same occur-

rence, and this does not happen from any disease or infection, as many have erroneously supposed, but from sympathy. But how this circumstance has such an effect upon the imagination—if I may be allowed the expression—it is not easy to explain ; yet it has too frequently happened to admit of a doubt. It is therefore evident that as soon as such a circumstance occurs, other mares that may be in the same field should be removed to another pasture.

If mares are in good health while in foal, there is little danger of any mischance during parturition ; but should any such occur, either as regards a difficulty in parting with the foal or a wrong presentation, recourse must instantly be had to a regular experienced veterinary surgeon, who, from practice, is most likely to afford the necessary relief, and will save the suffering animal pain, and frequently save her life. Many fine mares have been lost, or rendered useless, by unskilful persons attempting to afford relief.

It would be absurd in a limited treatise to attempt laying down rules for enabling persons to perform those duties successfully, which can only be acquired by a lengthened course of study ; and which, consequently, would far exceed our limits. Mares generally come in heat about a month or six weeks after foaling.

Whenever parturition has been accomplished, the mare with her foal should be turned out into a pasture, which ought always to have a shed to retire to for shelter. If this happens to be early in the spring, that is, in April, before the grass has become sufficiently plentiful, then the mare should be supplied with one or two feeds of oats daily ; otherwise she will be unable to supply the foal with a sufficiency of milk, a lack of which is sure to lay the foundation of weakness, and in all probability arrest his growth, as this is the most important time in the life of a

colt. He never can turn out strong afterwards. In a week or two the foal will be able to take corn along with the mother. Bran and shielings are also very fit food for both mother and foal at this period ; but after grass grows more plentifully, both kinds of food may be discontinued.

If the mare is a draught one, she may be moderately worked a month after parturition ; and if on a road or at field-work, the foal may be allowed to follow after the dam, which will familiarize it with common objects, and make it more tractable and easier broken-in afterwards. At this time, however, care must be taken to feed the mare well ; she should have not less than two feeds of corn daily, besides grass, and both should be turned out in a field during the night, as a good supply of green food is most essential to the production of a sufficient supply of milk for the foal.

The foal may be weaned in five or six months, as may be determined from its strength. This is done by *gradually* withdrawing it from the use of milk, and after lessening the quantity for a week or two, it should be turned into a rick yard, where it can have benefit of both food and shelter during bad weather, and occasional draughts of meal and water given to it. The mare, in the meantime, should be put upon dryer food, so as to lessen the secretion of milk, and a little harder work will have a tendency to give a different action to the fluids, and thus diminish the supply. Should it, however, prove troublesome, a physic ball and one or two urine balls will be found beneficial in that case.

After the foal has been separated from the dam, he should be well fed until he has attained his full growth. During the earlier stages, bruised oats, bruised beans and pease, and also bran should form a part of his daily food. This applies to all kinds of colts, whether racers, hunters, draught, or

saddle kinds. During the time foals are sucking, the greatest caution is necessary not to overheat the dams, as this is sure to affect the milk, and proves most injurious to the colt.

To save the heavy expense of corn-feeding in young horses, clover, lucerne, and tares, are substituted; carrots have also been successfully used. But no species of food is so nourishing as pease, half a feed of which is about equal to a feed of oats. Young horses should invariably be plentifully fed; and a want of attention to this has been the cause of many of them acquiring the practice of biting their racks, and thence called *crib-biters*. To prevent this practice, a little hay or straw should be constantly kept in the rack.

SECTION II.—FEEDING.

Hay and oats being the chief food of horses, it is highly necessary that the owner should be, at least, a tolerable judge of their quality. The best kind of hay for horses is that which grows on upland meadows. It should be bright in its appearance, of a greenish cast, possessing a fragrant smell, and not too dry; for when it is so, and crackles when squeezed in the hand, it is a sure sign that its nutritive qualities have been dissipated by too long exposure to the sun and air after it has been cut. It would, however, be proper occasionally to vary the quality of hay by giving white clover and also rye-grass in limited quantities. Care must be taken that it is not too new, as in that state it is apt to produce acidity and flatulence. Eighteen pounds of hay is sufficient for any ordinary-sized horse per day, with six pounds of oats and two of beans. The cart or agricultural horse will require about eight pounds of oats, with two of beans, added to twenty-four pounds of chaff or

hay ; but a waggon or dray-horse will require about forty pounds weight daily, in proportions as above. The horse having consumed the above quantity of food, requires none during the night, and it would be proper to keep his rack without hay.

Some horses which are greedy feeders swallow their pease and oats without being properly chewed, and much of both pass through the stomach and intestines without undergoing any change ; indeed this is the case to a certain extent with all horses ; the consequence is, that the animal is deprived of their nutritive qualities. Horses which do not chew their food, can easily be detected by examining their dung, when it will be found to contain much grain in its perfect condition. When this is the case, the grain and pulse should be bruised, and also mixed with a portion of chaff, or cut hay and straw, which he cannot swallow without chewing. Besides deriving all the benefit of the nutritive qualities of the food, the animal is prevented from bolting his food too quickly and overloading his stomach, and rendering him unfit for being used immediately after feeding, as we have already explained when treating of the stomach, page 273. Slow feeding is of much importance, because in the lengthened process a greater portion of saliva is carried into the stomach with the food, which materially assists in the process of digestion.

Machines have been constructed for cutting hay into chaff. Meadow hay, clover, wheat, barley, and oat straw are cut into pieces of a little more than half an inch in length, and the whole well incorporated, and the proportional quantity of bruised oats and beans added, and measured out at meal-times to the animal. If the chaff is slightly wetted immediately before feeding, the horse is enabled easier to chew it. With some horses the bruised

grain produces scouring ; when this is the case, it must of course be given whole, but this very rarely happens with bruised grain when mixed with chaff, as we have above recommended. Horses that are driven rapidly in harness are more liable to be purged with bruised grain than those of slow draught ; and it has been found that diminishing the proportion of straw-chaff, and increasing the quantity of hay in the proportion of two trusses of hay to one of straw, has had the effect of obviating this. For horses which are used as hunters, the quantity of oats must be materially increased, as affording a substantial meal of considerably less bulk, and consequently does not distend the stomach so as to press upon the lungs, and thereby impede the process of breathing, as it will be seen by an examination of our figures, 1, 2, and 3, of plate ix, that these organs lie close to each other. It must be understood that the same applies to the race-horse as well as the hunter.

Horses which are accustomed to bruised grain and chaff, become so fond of it that they prefer it to the oats or beans alone. We cannot too strongly impress upon the owners of horses the danger of feeding them on either grain or hay which has become musty, as either are almost certain to induce disease ; and although no particular complaint is manifested, the horse is sure to fall off in condition. One great advantage in manger-feeding is that the horse when returning from a fatiguing journey or hard gallop, is sooner enabled to fill his stomach and lie down. If the rack is used, it takes from two to three hours to eat his fill, whereas a little more than an hour will suffice with bruised grain and chaff, which gives him so much more additional time to rest, which is of vast importance to such horses as are used in mail and stage-coaches.

When small farmers or others unfortunately possess musty

grain, the smell will to a considerable extent be removed by kiln-drying it ; but in this process great care must be taken not to overheat it, which renders it unpalatable to the horse, and more heating in its nature, producing an increased discharge of urine as well as mange of the skin, and is apt to induce inflammation of the eyelids and of the ball of the eye.

Horses that have been fed all winter on dry food will receive much benefit by being turned out in the spring, when the grass has become luxuriant ; or when this is inconvenient, cut grass may be given to him in the stable. The use of green tares will also be found very beneficial. Green food is certain to purge the animal, and that in a moderate degree, which carries off all the evil effects of constant feeding on hard meat.

Wheat is too expensive to be used as food for horses in Great Britain, and it is only when damaged that farmers think of applying it for this purpose. Although wheat contains a large portion of nutrition, it is not by any means desirable as food for a horse, as it has a tendency to form obstructions in the bowels by becoming caked ; and besides, it is difficult of digestion. This has been found to be especially the case when they are watered soon after feeding ; for the water, flowing quickly through the stomach and small intestines in its passage to the cæcum, or blind-gut, carries off with it all the gelatinous substance of the grain, and leaves the more indissoluble mass behind, and the masses thereby formed have often caused the death of the horse. A small portion of hay should be given along with wheat.

Beans are an excellent and nutritious food, but should never be given whole when dried, as their skin being so very hard, the horse swallows many of them whole, or drops others.

Pease are still more nutritive than beans ; but should never be given unbruised, being difficult to grind by the horse, in consequence of their round form. They are frequently swallowed quite whole by the horse, and when an undue quantity has been given, the most injurious consequences have happened to the animals, especially if much water is given soon after being fed with them. Instances have occurred where the stomach has burst by the swelling of pease in the stomach.

On the continent, barley is a common food of the horse. It contains more nourishment than oats ; yet it does not seem so well adapted for the food of the horse as oats, except where the animals are hard worked. It has been found that horses fed on barley are more liable to be affected with complaints of an inflammatory character, and likewise to mange and surfeit. In Britain, farmers have been known to feed their horses on unsound and unsaleable barley, which in many instances has produced serious maladies. In the form of mashes, barley is found to be advantageous, from its stimulating properties ; but we certainly do not approve of it as a general food.

Tares are valuable in their green state in the early part of summer, as they possess medicinal properties, as well as being very nutritive. In the event of horses having surfeit-lumps, green tares, to the extent of ten or twelve pounds daily, cut up and mixed with the chaff, will be found to remove them very quickly.

It has been satisfactorily proved that tares have not the effect of producing a rough coat, although this opinion still exists with many persons.

Carrots form an excellent food for the horse when mixed with the chaff in the proportion of half-a-bushel a day, and excluding the oats and beans. With this quantity, or not

exceeding three quarters of a bushel, horses will stand any quantity of work.

Horses are particularly fond of raw potatoes. I have found them prefer this to every other food ; but they have been found more nutritive when boiled, and they will thrive well upon them. We would, however, recommend their being mixed with the manger food, in the proportion of one pound of boiled potatoes to two and a half of the other mixture. Horses fed upon potatoes, as above recommended, require less water

Swedish turnips are a tolerably nutritive food, and very easy of digestion. Twenty-five to thirty pounds of sliced turnip, to twelve pounds of bruised oats and six pounds of straw, forms an excellent meal for a horse.

Nothing contributes more to the health of a horse than feeding regularly, and at fixed intervals. As his digestion is very rapid, he should be regularly fed. When kept long without food, the horse is apt to take his meal too rapidly, and by distending the stomach, produce stomach-staggers.

That the food may be well ground down to prepare it for digestion, it must be previously moistened. The horse is fed in a stable on dry food. In the vicinity of the mouth are placed the salivary glands, destined to secrete abundantly a limpid fluid of a saltish taste. This fluid is conducted into the mouth by various ducts while the animal is chewing his food ; and being mixed with it, assists in making it more easily ground and conducted into the stomach, and better prepared for digestion.

Sometimes horses are afflicted with inflammation in the stomach from having eaten poisonous plants, although this is of rare occurrence. It is, however, difficult to ascertain whether it proceeds from the stomach or bowels ; therefore

it would be imprudent for any one but an experienced veterinary surgeon to attempt a cure.

The deleterious plants of this country which affect the horse are but few. The common hemlock, and water-hemlock, which prove a deadly poison to many other animals, are eaten with impunity by the horse.

Water-parsley, if not eaten in too large quantities, will not act as a poison ; but if much is consumed, will produce palsy.

Water-dropwort is poisonous, but is generally rejected by horses ; although instances have occurred of mares in foal having died from eating it. Sometimes inflammation follows it, and when this is the case, bleeding must be had recourse to, and vinegar and gruel given internally. Of the former, half-a-pint may be administered at a time.

But of all the vegetable poisons, yew is the most to be guarded against, as horses are very apt to eat its leaves. When eaten it produces great sleepiness, from which it is hardly possible to rouse the animal ; and that is only for short intervals, for he soon relapses into a torpid state, and dies without manifesting pain. The remedy to be tried is the following :—Give ten grains of the farina of the croton-nut whenever it is known the horse has eaten yew-leaves ; then a drink of half-a-pint of vinegar, mixed with a pint of gruel. Repeat the croton every six hours until it operates.

OF DRINK.

Nothing is of greater importance than the quantity of water which is given to a horse as drink. Accustomed for the most part to dry food, water is indispensable to nourishment and health. Its quality, too, is of vast importance. Mr. Lawrence, in his treatise entitled "The Horse," makes

the following remarks, which convey all we can say upon this point :—

“It has frequently been observed, and not easily accounted for, that horses do not thrive on changing from one part of the country to another, although their treatment in every respect be the same, difference of water excepted. This perhaps may, in a great measure, be owing to the quality of the water they drink, and which may be possessed of different chemical properties from that to which they had before been accustomed.

“This is particularly observed in those places where the stable-yards are supplied from pit-wells, some of which are very deep, and the water very hard, which occasions that chilliness, trembling, and shaking which is frequently observed in horses when they drink it immediately after it is new pumped, and which causes their coats to stare and stand on end for a considerable time, and sometimes they are griped, and much out of order. Spring-water is liable to partake of all the metallic or mineral properties of the strata through which it passes ; hence it becomes noxious or salutary according to the nature of those substances with which it has been in contact. River-water has, likewise, its different qualities, from the various soils through which it travels ; but, in general, it is much softer than water that runs underground. Pond-water, (under which head may be included all stagnant water, which generally proceeds from rain,) if lying on a clear and clayey bottom, and fresh, answers well for cattle of all kinds ; but in warm weather it is apt to corrupt and ferment, which renders it unwholesome and unfit for use.”

To correct the hardness of pit-water, and render it more salutary for horses to drink, it should be pumped into a large trough, and exposed to the open air for some time

before it is used ; or if a cart-load or two of clay or chalk be thrown into the well, it will greatly improve the water. It has likewise been found that breaking down a piece of clay, about the size of an apple, in a pailful of hard water, before it is given to a horse to drink, morning and evening, has produced a considerable change in their coats.

Indeed it will be found where horses are obliged to drink hard water, they are for the most part rough-haired, and at the same time have a great deal of dusty matter at the roots of their coats, even though they are well curried and brushed every day ; from which we infer this is occasioned by the bad quality of the water they drink.

In cases where stagnant water can only be procured in summer, unslacked lime will materially improve it ; but ground charcoal will render even the most impure water sweet and wholesome.

When horses are warm, they should never be allowed more than a few mouthfuls of water ; neither should they be permitted to drink too freely while on a journey, or while they are subjected to any active employment. But when they have cooled, two or three quarts may be given to them, and after that their feed. Before finishing their corn, two or three quarts more may be offered them.

If horses refuse their food after travelling, it is a bad sign of them, as a healthy and vigorous animal will always feed well after he is properly cooled down and has had a drink ; and when horses do refuse their food on a journey, they ought not to be again made to travel that day, or at least for some considerable time afterwards, and not until they have taken their feed.

Horses will invariably, if left to themselves, prefer soft to hard water, and when cool may be allowed to drink their fill, and no evil will result therefrom. Instinct or expe-

rience has taught them this ; they will leave crystalline hard water, and resort to soft, however turbid it may be.

Horses kept in the stable should be watered in summer at least three times a day ; and if this salutary advice be attended to, many of the diseases to which they are liable will be prevented. Horses subjected to hard labour require a great deal of drink to supply that moisture which is thrown off by perspiration, and the poor animals but too frequently suffer much from a want of due attention to this. Let any one observe how eagerly a horse plunges his muzzle into a pail of water, and with what difficulty he can be removed from it while a drop remains, and he will be able to judge of the thirst which he must have suffered. If they are allowed a moderate quantity of water while warm, they must not be permitted to stand still for some time afterwards, otherwise very bad consequences may follow ; and nothing is so likely irreparably to injure the wind of a horse, as to gallop him immediately after drinking ; but a little, taken at intervals, will not harm him. If horses are allowed to drink freely when overheated, and remain quiet, violent spasms, inflammation, and sudden death is likely to ensue.

SECTION III.—TRAINING.

Training should be commenced as soon as the colt is taken from the mare, and, as before hinted at, he should be placed under the care of a man of a mild and gentle disposition. Kind treatment and caresses are the only sure methods to obtain obedience, attachment, and confidence in man. This maxim should be applied to horses even of the most stubborn temper, for assuredly if gentle measures will not render them obedient, harsh treatment never will. In short, most of the vices in horses may be traced to their being early intrusted to the care of persons of brutal dis-

positions, who destroy their temper by cruelty and injudicious severity. Others again are taught all manner of tricks for the gratification of idle folly. Tractability, steadiness, and good temper are the qualities for which a horse is chiefly valuable to man ; so that the utmost attention should be paid by breeders to points on which depend so much of the safety and comfort of those who may become their owners. Indeed gentle treatment has been more effectual in taming wild animals than any other.

Much difference of opinion prevails as to the time which horses ought to be worked. My unalterable belief is, that at three years is the earliest period at which a horse should be used either for the turf, hunting, the road, or harness ; consequently breaking-in should not be completed until after the second winter, although of course it ought to be gone about gradually from his weaning. A bit should be selected with a plain snaffle, that will not hurt his mouth, and it ought to be of a small size, in the centre of which should be attached a stabbering-bit, which, resting gently upon the tongue, excites the horse to move his jaws, and prevents him from pressing too heavily upon it, as this would deaden and harden the mouth, which is one of the worst faults a horse can have. He should be accustomed to the use of it in his mouth for some days before the hand of the trainer is applied to it. He ought then to be led out, and gently checked by it when he is getting too playful, until by degrees he will bear its control without manifesting irritation.

After the colt has thus been partially broken-in, the next thing to teach him is implicit obedience to his instructor. This should be effected by steadiness and firmness, while severity should be carefully avoided. He should be spoken to in a soothing, rather than an angry tone of voice. He

must be taught to know the effect of the whip and spur, but their uses must be administered with much caution ; and only showing him that we have the power of enforcing submission.

If a young horse refuses to allow the bit to be placed in his mouth, it must not be attempted to accomplish it by force, because this will only redouble the resistance. Coaxing and gentle trials day after day will be the quickest means of accomplishing the object. When it has been effected, then kindness should be shown him, and caresses used. A head-stall is now put on him, and a cavesson is then affixed to it, with long reins. The cavesson is an apparatus intended to confine and pinch the nose ; but this being a powerful and severe instrument, it should be used gently. Instances have been known of the bones and gristle of the nose becoming diseased from harshly pulling the cavesson. He must first be taught to obey the action of the rein, and after he has become obedient to it, he must next be led round a ring on soft ground. To the cavesson is attached a small rope or cord, which is held by the breaker, and the colt is first led round the circle at a walk. When he has acquired his paces, and become obedient to this action, he should then be trotted round the circle, but at an easy rate, and only for a short time at once. When stopped, he should be caressed. He should be accustomed to go both to the right and left. If any circumstance occurs which may frighten a young horse, and he refuses to proceed in consequence, another horse ought to be led on before him, and he is almost certain to follow. At first the circles should be large, and gradually diminished ; because small ones are apt to produce giddiness and too much fatigue at first. In performing those revolutions, he should be frequently stopped by the

trainer, and pulled up to him gently, to show him that no injury is intended, and he ought to be caressed at the same time. The cord should be long and loose ; his paces all regular and correct, and if he gets false in these, he should be at once stopped, and recommenced. Should he become restiff or frolicsome, let the person who holds the whip crack it to show him he is there, but upon no account should he touch the horse with it ; or if he stands still and plunges or rears, the whip should be cracked, and only ought to be applied gently to him when he absolutely refuses to proceed. When the trainer changes the direction of the colt, he should invariably be stopt, and each time be enticed to approach, which will have the effect of accustoming him to have confidence in his attendant or groom, always caressing him when obedient ; and whatever gait he is performing, on no account allow him to depart from it, as it is only by strict attention to the action wanted that he will learn to be correct in his paces. If he happens to hold his head too low, shake the cavesson, to remind him to raise it ; but be sure always to adopt one mode of directing his attention to any particular thing required. All his lessons should be short, the pace should be kept distinct and perfect in each, and he should be rewarded for attention and obedience by handfulls of corn and caresses. When the colt becomes tractable and obedient in all his lessons, crupper-straps, or something similar, should be attached to his clothing to accustom him to it, that he may not be afterwards tickled and become restiff by the rider's coat-tails. A few days will suffice to make him endure this patiently, because when he finds that he suffers no harm from them, he soon becomes reconciled to them.

The regular riding-bit should now be applied to his mouth. It ought to be large and smooth, to which should

be attached the reins, buckled to a ring on either side of the pad. The reins ought to be flat and allowed to be slack, and gradually tightened. The trainer should occasionally stand in front of the animal, and take hold of each side-rein near to the mouth, gently press upon it, and thus begin to teach him to back and stop by the pressure of the rein, always rewarding obedience, but gently punishing him by a slight jerk when obstinate.

The colt should now be taken to the street, or road, and led about, to accustom him to meet carts and other objects without starting and shying; but if he does start or shy, he should not be allowed to pass on, but ought to be quietly led up to the object of his fear, and shown that it will not harm him. But on no account should he be beaten on such occasions. And should he be still shy, let him be taken past the object of his fear, first at a greater distance, and then nearer, until he may be quietly led close to it. It is only by patience on the part of the breaker that these difficulties are got the better of; whereas if the animal is forcibly and suddenly taken up to the object before the fear has subsided, a habit may be established, which will never afterwards be eradicated. Nothing can be more absurd than to beat even an adult and thorough-trained horse for shying. This is certain to establish rather than remove the fault. The same system should be adopted with an aged horse, as recommended for the colt, and this I have found effectual in every case. The best horse is liable occasionally to shy at a white post, or other object which he may suddenly come upon, especially in the evening or in the dark; but on no account should the rider proceed on his journey without quietly and deliberately leading up his horse to the object, and allowing him to see what it is.

When the colt has been inured to walking on a road or

street, and will pass any object that may be presented without shying, the breaker should then walk by his side, throw his right arm over his back, while he holds the reins in his left. The breaker must invariably walk by the left side of the animal, so that he may be thoroughly accustomed to permit him to approach on that side, which is the one universally adopted for mounting. The pace should now be occasionally quickened, and at the same time the colt should be gently tapped on the right side with the whip, which ought always be held in the right hand. This being repeated at each time the pace is quickened, will familiarise the animal to it, and will associate in his mind the increased action required by such a signal. Horses in general have excellent memories, and seldom forget what they are taught. If, however, the colt does not attend to the gentle tap, a sharper one may be applied, and the feeling of pain exerted, as a monitor to increased action. These lessons must be repeated until the animal is reduced to perfect obedience.

The next thing to be attended to is to apply the saddle, which should be put on his back with great caution. The breaker should place himself at the head of the colt, and by caresses and patting divert his attention. Let one assistant on the off side put the saddle gently on his back, while another on the near side gets hold of the girths, and slowly tightens them. They ought to be but loosely drawn at first, only to such an extent as to prevent the saddle from turning round. If a crupper is used, it ought to be sufficiently long to prevent it from galling the tail. He should then be led about with the saddle on his back for at least a couple of days, the trainer occasionally leaning his arm as heavily as possible. The girths during this time must be gradually tightened, until that firmness is acquired which is

necessary when a man is mounted on his back. If the previous process of breaking has been effectually accomplished, he will generally submit to all this quietly, if done with caution. On or about the third day the trainer must then attempt to mount. At first two assistants will be absolutely necessary. His first business will be to remain at the head of the animal, patting and caressing him, while the person who intends to mount must first pull the left or near stirrup pretty heavily with both hands, while the man on the off side presses equally on the other stirrup; and after having repeated this several times, the person on the near side must put his left foot into the stirrup, and gradually apply pressure to it, the man on the off side pressing on the other stirrup-leather as before, until the colt will endure the whole weight of the rider, mounted, and leaning his hands upon the saddle; and if the animal proves very refractory, no further attempt must be made at that time. If this is in the morning, the same course may be pursued in the evening, and by repeating twice a day, it may be fairly mounted in about two days. During this operation, a handful of corn should be occasionally given to the colt.

After the colt has been fairly accustomed to the rider balancing himself in the stirrup, and has become docile under it, the rider may gently throw his right leg over the saddle, and quietly seat himself, taking care that he has a firm hold of the reins in case the horse should plunge and attempt to throw him off. But if he submits to it with little resistance, the breaker will then gently and slowly lead him round the ring, while he is followed by a man with a whip, as in the early part of his training; the rider sits quite still. He will then endeavour to direct the horse round the ring by means of the reins, which must be done by as gentle pressure as possible, while he frequently pats the

animal on the neck and encourages him to proceed. When he intends to dismount, it must be done slowly and with much caution, and the colt should be given some corn or green meat to encourage him to obedience. Mounting and dismounting should now be frequently practised for a day or two, but he ought not to be much exercised during this operation. When he has become quite reconciled to this, the rider must now apply pressure with his legs, and also a gentle touch of the heels when he desires to quicken his pace, which will finish the process of training.

All this accomplished, rewards must be gradually withdrawn, and obedience instilled by gentle and kind treatment, which in most instances is all that is required. But should the colt at any time become obstinate and resist the commands of his rider, the whip and the spur must be applied to enforce obedience. These means, however, should be very sparingly used, for whenever he finds that he must yield to the power of his rider, he will seldom attempt to disobey him ; but on a recurrence of restiffness, soothing should first be attempted to restrain him, which in most cases will have the effect ; firmness and gentleness are more likely to prove effectual than cruelty and harshness. Few horses are naturally vicious.

The above is applicable to a horse that is to be used for riding, we come now to those means best adapted for fitting him to endure harness and the draught. At first, portions of the harness should only be placed upon him, and then blind-winkers, and in a few days the whole trappings. He should then be put into the shafts of an empty cart or waggon ; and the better to teach him to draw, another horse may be placed before, and there is little danger but he will soon be taught to follow, gentle patting alone being used to encourage him. He should then be tried alone, and

if he works, then a little weight may be added, and increased by degrees, until he will draw a full load. The horses used in agriculture will frequently be required for riding, and if they have not been regularly broken-in, as we have directed, before putting them in harness, their feeder should be put on their backs while they are in the team, and it is seldom they will resist his continuing to ride.

We would caution all those who ride horses occasionally used in harness, to keep a firm bridle-hand, that is, to feel the mouth constantly ; because they are accustomed to depend for support on the wheel-carriage, and thus have a tendency to lean forward, and hence are very apt to stumble and come down upon the road.

We shall not attempt to give directions for training the higher bred blood-horses for carriages and the turf. This can only be effectually accomplished by persons whose entire profession it is. To those unaccustomed to it, the attempt is at best a hazardous undertaking.

CHAPTER XV.

OF STABLING, EXERCISE, CLOTHING, &c.

THE STABLE.

A PROPERLY constructed and well-regulated stable is of the utmost importance. All proprietors of horses ought to give much attention to this subject, as for want of a thorough acquaintance with, and care as regards it, many of the diseases incidental to horses have their origin. A stable

ought to be built in a dry situation, roomy, high in the roof, and well aired, without, however, having a great draught passing through it ; but when the horses are out, the stable doors and windows should be thrown wide open, and allowed to remain so as long as they are abroad. But nothing is worse than to allow the wind to blow directly upon a horse, or a cross-draught of any kind. Gröoms, however, are too prone to go to the other extreme, and in general allow the stable to become too warm, and block up with the utmost care every place where air is admitted. Some practice this from an erroneous opinion that they should be kept very warm, while too many do so that the animals may have a fine shining coat. By this injudicious practice, the air becomes contaminated with the unwholesome vapour generated from the litter and urine, which produces a strong exhalation of ammoniacal gas. This being breathed for a length of time, has a pernicious effect upon the lungs of the horses ; digestion is impaired, and all the vital functions injured. Inflammation of the eyes, chronic cough, with a host of concomitant ailments, are the consequences of inhaling this deteriorated and semi-poisonous vapour. Let any person enter a stable in the morning which is not properly ventilated, and he will be sensibly alive to the pungent smell, and even pain in the eyes, produced by the vitiated atmosphere. The chemical action of the urine commences soon after it is voided. It is from this cause that horses are but too frequently attacked with distempers in the spring of the year, or in autumn. This is, however, seldom the case in small well-regulated stables. In short, I have gone into many stables where their heat induced copious perspiration in a few minutes. This must have a strong effect upon the skin of the horse, and especially if his clothing is on ; and when strapped and suddenly

taken to the open air thus overheated, induces coughs and other diseases in the mucous membrane, as well as inflammation in the kidneys and lungs ; and should the weather be cold, rheumatism and stiffness in the joints, because horses are frequently allowed to stand for some time before they are put in motion, and are in consequence chilled. It also too frequently happens that carriage or cart-horses are allowed to stand an hour or more in harness after they have been overheated by severe exercise or labour. This is the reason why such horses seldom live to be aged, and too frequently die in the prime of life. The horses of stage and hackney coaches seldom live beyond the age of eight or nine years ; and this is chiefly owing to the carelessness of their drivers and grooms ; whereas horses have been known to acquire a very great age when they are looked after with that care which so valuable and useful an animal requires. A remarkable example of this occurred in Warrington, where a horse attained the extraordinary age of seventy-six years, and was well known by the name of Old Billy. As far as I have been able to learn, this was the oldest horse which ever lived, and may hence be considered the Parr among horses. He belonged to the Mersey and Irwell Navigation Company, and more than half his life had been spent in towing boats. The company, for many of his last years, on account of his great age, kept him without working. In summer he grazed on the luxuriant pasture on the banks of the Mersey, and in winter was taken into stable and fed on mashes and soft food. When he died, the company had his head preserved, the skin stuffed, and the cranium cleaned, and presented it to the Museum of the Manchester Natural History Society, where it is still to be seen.

Few people are aware that after a horse has been worked hard or galloped, that his return to a hot stable is nearly as

dangerous as subjecting him to a cold atmosphere from a warm stable. Many a horse has been seized with inflammation and fever after having been worked and returned to a hot stable, filled with the noxious gas above alluded to, and more especially if he was cold at the time. Nothing is worse than the sudden change from one temperature to another. From this thousands of horses yearly meet their death.

Stables should never be built longer than with accommodation for five or six horses, as repose after working is of vital importance ; and where there are many together, it is more than probable that some will be awake while the others are asleep, and disturb them.

The dimensions of a stable, in proportion to the number of horses, is a most important point. A stable for six horses should be from thirty-eight to forty feet in length, from thirteen to fifteen feet wide, and about twelve feet in height. It is always of consequence to have the roof of a stable plastered, whether there is a hay loft above it or not. This will prevent currents of air from passing through the floor. There should always be a few central tiles to allow the hot air to escape and give place to that which is pure and cold. These tiles should be furnished with protecting ledges, to prevent the rain from entering ; or, what is perhaps better, large tubes should be carried through the roof, with caps a little way above them, to prevent the rain from beating in. A third plan is to have gratings placed high in the walls. These last ought to be as near the roof as possible, and shut and opened by a cover, as occasion requires.

In summer and autumn the stable ought never to be more than a few degrees warmer than the atmosphere. In winter not more than fifteen degrees, because the hair is thicker at this season than in summer.

If the hay is kept in a loft over the stable, there should be no holes over the racks for throwing down the hay, as by these openings foul air will be carried up to the hay, and render it unwholesome. And besides, it not unfrequently happens that seeds fall down into the eyes of the horse, and occasion serious inflammation in them.

While the floor of the stalls should be so constructed that the urine will be speedily carried off, yet a little reflection will show that the practice of making them gradually slope from the stall to the outside is very prejudicial to the horse, and too frequently the cause of lameness by straining the back sinews, that is, the *tendo achilles*. Mr. Lawrence justly remarks, that "If the reader will stand for a few minutes with his toes higher than his heels, the pain he will feel in the calves of his legs will soon convince him of the truth of this remark. Hence, when a horse is not eating, he always endeavours to find his level, either by standing across the stall, or else as far back as his halter will permit, so that his hind legs may meet the ascent of the other side of the channel."

This sloping direction of the floor of the stall is also a frequent cause of contraction of the heels, by throwing too great a proportion of the weight upon the toes of the foot, and removing that pressure which tends most to keep the heels open. It must therefore be evident that the floor should slant no more than is absolutely necessary to drain off the urine sufficiently quick to prevent chemical action taking place. This is the kind of stall most suitable for mares, but for horses it should be constructed with a grating in the centre, and an inclination of the floor on every side towards the middle. This should be carried off to the outside by means of a small drain and lodged in a reservoir, as urine is a valuable acquisition to the farmer. To prevent

an offensive smell or current of air passing through the drains, cheap traps have been invented to stop the grating. I have lately seen stables constructed with the patent wooden pavement, which answers many good purposes ; it is much warmer for the feet, and at the same time softer, and entirely free from noise.

Some persons imagine that the horse should not stand on litter during the day, because the heat which it produces may prove injurious to the hoof of the horse. I imagine that little injury will result from standing all day on litter, providing it be dry and not so deep as entirely to cover the hoof. It is quite certain that standing on litter must be much more comfortable to the horse than on cold, hard stones, and we therefore recommend its adoption.

Farmers are in the practice of using the haum of peas, beans, and potatoes, as well as heath. But we would have them to recollect that they must be much oftener changed than straw, as they soon begin to ferment, and consequently the gas emanating from them is noxious ; and besides, the heated litter proves injurious to the feet. We cannot too strongly impress upon farmers and others the great impropriety of allowing an accumulation of litter in their stalls and stables. Some are in the practice of nightly heaping fresh straw or other materials over that of the preceding day, instead of having it removed. It is sure to be hurtful to the animal from the reasons we have above stated.

Before closing this subject, we must state our entire disapprobation of double-headed stables, that is, having a range of stalls along each wall, with the rear of the horses standing towards each other. It too frequently happens in inns, that for want of room these stables are so narrow that the hind legs of horses are too near each other, and serious injury is often done by kicking. Many fine horses have

been rendered lame for life, and even have had their legs broken, from the kicks of quarrelsome horses. If it is absolutely necessary that such a construction must be adopted, then there ought to be at least a free passage of about eight feet. Every stall should be at least six feet wide, and ought always to be divided by a boarded partition as high as the back of the horse.

MANAGEMENT OF THE FEET.

The feet of a horse should be examined with great care every morning, for the purpose of ascertaining, in the first place, if the shoes are all firm, and that none of the clenches are raised, which might wound the limbs. A worn shoe is also liable to press on the sole or heel, and prove injurious.

One of the first things to be attended to after a horse has come off a journey, or has ceased from his day's labour, is that his heels should be thoroughly brushed out. If an agricultural or cart-horse, it will be better to apply the hand than washing, as the long hair with which the heels are generally invested will take a considerable time to dry, especially during winter, which may occasion grease. The feet should then be stopped, after the picker has been used to remove all stones or clay between the hoofs and shoes. Cow-dung makes the best stopping, and keeps the feet cool, and the soles elastic. With other horses, the feet may be washed with a brush. The shoes should be removed at least once a month.

LIGHT.

It is surprising that in many parts of the country, farmers' stables, and indeed those of other individuals, have no other light than probably what is admitted by a few panes of glass over the door ; or some have an open window

closed by a shutter, which is only occasionally opened. To this cause may be attributed many of the diseases to which the eyes of horses are liable, and ultimately blindness itself. It is easy to imagine what the animal must feel, and the consequences which are likely to be the result, from our own painful and giddy sensations on issuing from a dark place to the full blaze of the noonday sun, or even when a candle is introduced, after sitting for some time in a dark room. A repetition of this several times during the day would inevitably be attended with most injurious consequences, from the sudden shock it gives to the optic nerve, and the vessels of the retina. Besides, it may produce inflammation in the coating of the eye, which may end in the total destruction of the organ. There can be little doubt but horses that are liable to start at objects, frequently owe this dangerous quality to the cause above alluded to.

A stable ought to be as well lighted as a house, so that this source of injury may be avoided, and also on account of all parts of it being properly seen, so that masters may be enabled to detect a want of due attention to cleanliness, a subject which we cannot too often impress upon masters and servants.

In stables which have a due quantity of light, the shutters may be partially closed when the animals have fed properly, and lie down to sleep. Many horses stand too long upon their limbs, and therefore this subdued light is more apt to produce drowsiness, and thus incline him to repose, during which time the food is well known to have the most salutary effect in increasing the muscular fibre, and the cellular and adipose substances.

While we have shown the utility of a well-lighted stable, we would guard our readers against allowing that part of the wall next the head of the horse being too light ; because

the refraction of the rays of light constantly beaming into the eye will stimulate the nerve too much, and is apt to produce exhaustion of energy in the optic nerve and retina. If the stable is well provided with windows, the walls should be painted of some subdued tone of colour ; and when otherwise, white should be used.

EXERCISE.

This with the horse, as with man himself, is of paramount importance for the preservation of health. A horse kept in a stable ought to be exercised for two hours regularly each day, without which he will never be fit for work, as he will suffer more from absolute idleness than hard labour. The quantity of exercise should be regulated according to the age of the horse. A young horse requires more than an old one ; but violent exercise must be carefully guarded against, especially with young horses, which, although prone to activity, must not be indulged too freely. The beginning and termination should be moderate, and in the middle he may be trotted smartly, or galloped for a short distance. When horses are of full habit, the exercise should be of medium quantity, and increased a little daily ; but those who fatigue or even drive a horse hard when in full condition, may find it followed by inflammation.

In training the race-horse and the hunter, the utmost regularity in exercising them is quite indispensable, otherwise they never can perform the task required of them, and grievous disappointment is certain to be the result. The one will be knocked up with half a day's work, while the other is certain to be winded before he performs a circuit of the course.

I have particularly to caution the inexperienced against working a newly-purchased horse too hard, as these are

invariably made up by the dealer, by feeding and idleness, so as to please the eye. To take a horse to the hunting-field under such circumstances, is running a great hazard. Let him be carefully and regularly worked for some days before hunting him, and there is little danger of bad consequences following, if gradually cooled and well groomed at the end of his work. We would recommend the proprietors of horses to attend themselves to this salutary and necessary operation, as grooms but too frequently neglect it, or, in many instances, injudiciously perform it.

The above remarks are applicable to the horses of the gentleman and tradesman, but those of the agriculturist need but little attention, as they are generally worked with moderation and regularity, and hence are not predisposed to those diseases where a different mode of treatment exists.

GROOMING.

Horses kept constantly in a stable should be subjected to constant grooming. It is of the utmost consequence to their health and appearance. The free use of the curry-comb and brush should never be neglected, as the scurf which accumulates at the roots of the hair, and stops the pores of the skin, will otherwise prove injurious to the health of horses, by retarding free perspiration. Horses which are turned out in a field do not require grooming, as Nature provides a means of removing the scurf. Besides, without grooming the coat of a horse will never have that sleek appearance which so much heightens the beauty of this fine animal. Lazy and careless grooms prefer giving the coat that smooth texture, by keeping the stable above that temperature which is safe for the health of the horse. The use of the currycomb and brush gives an increased action to the surface of the skin, and

accelerates the circulation in the external vessels, which stimulates the animal and rouses all his energies. Indeed any one may perceive the salutary effects of grooming on the spirits of the horse after this operation, which should always be performed in the open air when the weather is favourable, which braces the skin and conduces to health. It however frequently happens that grooms in using the curry-comb give too much pressure, and thereby often irritate the cuticle and give pain instead of pleasure to the animal, especially to those which have thin skins. It ought therefore to be used with gentleness, and a longer time bestowed upon it. We also disapprove of a very hard brush, and especially one which has irregular hairs on the surface. A soft brush well applied will be equally effective, and produce less irritation to the horse.

After violent exercise, or a long journey, the legs of horses should be well rubbed down both with the hand and brush. This will prevent swelling, and even allay it if it has actually taken place.

CLOTHING.

If stables are kept dry and all cross-draughts are avoided, then the use of horse-cloths will be unnecessary. Nature has given the animal a covering which perfectly fits it, to prevent the necessity of artificial clothing while under a comfortable roof.

If a horse has been overheated, the true method to prevent his taking cold when put in the stable is to rub him well down with straw or hay until his skin is dry ; but if it should so happen that the groom cannot possibly spare time at that moment to attend to it, a cloth may be thrown across his loins, until he is fairly cooled down, when it should be immediately removed.

Nothing can be more absurd than to clothe coach and post-horses in the stable, because when out of doors this cannot be done, and the consequence is, it renders them extremely susceptible to colds and inflammation. When horses are overheated and have occasion to stand any length of time in the street, it will be a very proper precaution to throw a cloth over their loins, but this will be only necessary in very cold weather. In summer it would be rather injurious than otherwise.

But with horses that are used for riding, the greatest attention must be paid to prevent them being subjected to any sudden transition from heat to cold; and, as above noticed, good grooming is the best and surest preventive.

We would recommend that all stables should be provided with a thermometer, so as to enable the groom to preserve, as far as possible, a uniform temperature.



C H A P T E R X V .

VICES AND DANGEROUS HABITS OF THE HORSE.

THE horse is an animal of a noble and generous disposition, and naturally possessed of few vices, although he is occasionally met with having a bad and even furious temper, and, as may be expected, manifests great variety of natural habit. His vices, however, are too often attributable to the effects of improper training, and to tricks which he is taught by the bad treatment and folly of his groom or keeper.

The first breaking-in of the horse should only be intrusted to persons of mild dispositions, as it is by kind and

patient treatment alone that we can hope to succeed in rendering this valuable animal truly useful and docile. I have no doubt but in nine cases out of ten, where horses exhibit furious or stubborn tempers, that these have been produced from the cruelty and ignorance of their first trainers.

RESTIFFNESS.

The most unpleasant and dangerous of all vices possessed by the horse is that of restiffness. Sometimes this proceeds from a naturally bad temper, and at others from faultiness in education. This term includes plunging, rearing, kicking, bolting, and general impatience while mounting. A horse with any of the above faults can never be depended upon, for, although we may use means to counteract a particular vice, whether by compulsion or gentle measures, he may exhibit that vice when we are off our guard and are the least expecting it. Force may bring him to obedience, and he may succumb to him who has had the determination to subjugate him ; but when mounted by another he is extremely likely to break out again. A horse that kicks in harness may be driven with safety by a cautious and experienced driver or coachman, but still there is no certainty of his not exhibiting the same trick years afterwards ; indeed most horses which have been kickers return to it again.

However high the temper which the horse may exhibit, we would recommend that he should be broken from his vices by kind and soothing means, and these exercised with patience for a considerable length of time ; and force should only be resorted to when all other means have failed.

There have been several striking instances of persons who possessed the power of taming vicious horses by gentle measures ; the most remarkable is recorded in the Rev. Mr. "Townsend's Statistical Survey of the County of Cork," who

remarks, that although the following circumstances appear almost incredible, yet they are nevertheless true, as he was an eye-witness to them :—"James Sullivan was a native of the county of Cork, and an awkward, ignorant rustic of the lowest class, generally known by the appellation of the *whisperer*; and his profession was horse-breaking. The credulity of the vulgar bestowed that epithet upon him from an opinion that he communicated his wishes to the animal by means of a whisper, and the singularity of his method gave some colour to the superstitious belief. As far as the sphere of his control extended, the boast of *veni, vidi, vici*, was more justly claimed by James Sullivan than by Cæsar, or even Buonaparte himself. How his art was acquired, or in what it consisted, is likely to remain for ever unknown, as he has lately left the world without divulging it. His son, who follows the same occupation, possesses but a small portion of the art, having either never learned the true secret, or being incapable of putting it in practice. The wonder of his skill consisted in the short time requisite to accomplish his design, which was performed in private, and without any apparent means of coercion. Every description of horse, or even mule, whether previously broke or unhandled, whatever their peculiar vices or ill habits might have been, submitted without show of resistance to the magical influence of his art, and, in the short space of half-an-hour, became gentle and tractable. The effect, although instantaneously produced, was generally durable. Though more submissive to him than to others, yet they seem to have acquired a docility unknown before. When sent for to tame a vicious horse, he directed the stable in which he and the object of his experiment were placed, to be shut, with orders not to open the door until a signal was given. After a *tête-a-tête* between him and the horse for

about half-an-hour, during which little or no bustle was heard, the signal was made ; and after opening the door, the horse was seen lying down, and the man by his side, playing familiarly with him like a child with a puppy-dog. From that time he was found perfectly willing to submit to discipline, however repugnant to his nature before. Some saw his skill tried on a horse which could never before be brought to stand for a smith to shoe him. The day after Sullivan's half-hour lecture, I went, not without some incredulity, to the smith's shop, with many other curious spectators, where we were eye-witnesses of the complete success of his art. This too had been a troop-horse, and it was supposed, not without reason, that after regimental discipline had failed, no other would be found availing. I observed that the animal seemed afraid whenever Sullivan spoke or looked at him. How that extraordinary ascendancy could have been obtained, it is difficult to conjecture. In common cases, this mysterious preparation was unnecessary. He seemed to possess an instinctive power of inspiring awe, the result, perhaps, of natural intrepidity, in which I believe a great part of his art consisted, though the circumstance of the *tête-à-tête* shows that upon particular occasions something more must have been added to it. A faculty like this would, in other hands, have made a fortune, and great offers have been made to him for the exercise of his art abroad ; but hunting, and attachment to his native soil, were his ruling passions. He lived at home in the style most agreeable to his disposition, and nothing could induce him to quit Dunhallow and the fox-hounds." Among the many striking performances in this way, none was more remarkable than his taming the celebrated racer King Pippin, one of the most ferocious horses that ever lived. Such was his furious temper, that to saddle and bridle him

was almost impracticable even by his ordinary attendants. His particular propensity was flying at and worrying any person who came within his reach ; and he has been known to turn round and tear the leg of his rider with his teeth, and drag him from his back. On one occasion, when he had bid defiance to all, the whisperer was sent for, who was shut up with him the whole night, and in the morning, so completely subdued was this furious animal, that he followed Sullivan round the course like a dog—lying down at his command—permitting his mouth to be opened, and any person's hand to be introduced into it—in short, he was as quiet as a lamb.

“At the same meeting on the Curragh of Kildare, he won a race, and continued his docility for three years ; but again broke out, and having killed a man in one of his furious fits, he was ordered to be destroyed.”

As I have before said, there is little chance of reclaiming a bad-tempered horse by harsh treatment, as I believe it will always be found to have an opposite tendency. An ill-tempered groom should never be allowed to enter a stable, however fit he may be for his business in other respects. For a surly, bullying fellow is sure to frighten horses so much that as soon as he enters the stable they will jump from side to side at his approach. Many a scar has been inflicted by such a man, by using his pitch-fork instead of soothing the animal for a fault ; and if asked how the horse came by the blemish, he invents a falsehood to account for it.

REARING.

Rearing is one of the worst vices in a horse, and is practised with the intent to throw the rider off. Sometimes it is the result of playfulness, but even then it is a dangerous

and unpleasant fault. The use of a deep curb and sharp bit will, in some instances, cause even a quiet horse to rear, and when this is the case, immediate recourse must be had to the snaffle-bridle.

As in kicking, however, this is seldom or never cured. Horse-breakers have attempted it by absurd and dangerous means, namely, that of pulling the horse backward on a soft piece of ground. This has ruined many horses, some having had their necks broken, or their spine so severely injured as to render them ever afterwards useless. If rearing proceeds from determinedly vicious habits, it is a hopeless case, as the animal seldom abandons it. Sometimes horses rear from playfulness, which is, however, very different from that which proceeds from passion.

BACKING, OR GIBBING.

It is not an unfrequent occurrence for horses in harness to back instead of drawing when first started, and some add to this considerable viciousness, combined with obstinacy. In this case soothing and persuasive coaxing should be tried, and some patience exercised ; and it is not until these have failed that the whip should be applied, and this must be exercised with moderation. In nine cases out of ten, if severely punished with the whip, the animal becomes obstinately determined not to move, or he may proceed a short way on his journey, and probably he will again stop at the first hill he comes to on the road.

In breaking, great care should be taken not to start the horse uphill when using the break, because he feels the entire weight of the machine at once, whereas if he were put in motion on a level road, the heavy pull would be less perceptible. Some trainers are so foolish as to teach the horse backing by placing his head uphill, and making the

animal draw a little. He feels the weight of the break, and then by halting and pulling him backwards the weight is removed, and the animal finds it much easier to back down hill than to pull ; and hence a habit of backing is acquired, which is both troublesome and dangerous.

With horses which have this habit at starting, the best method to break them of it is to place a large heavy stone behind the wheel ; and the horse, feeling he is unable to back, will generally proceed forward, finding it more easy to do so ; and by carefully continuing this practice, the horse will gradually be broken of the bad habit. Another plan, nearly as good, is to start the horse, if it can possibly be managed, with the back of the machine placed towards a rising ground ; and as it is more difficult at all times to force it backward than forward, besides the hill being against him, he will prefer going forward to backward. Sometimes it will be necessary to lead the horse for a short distance, and when the groom has quitted the reins, a gentle touch with the whip will make him proceed. If, however, he is determinedly obstinate, there will be little chance of succeeding by forcible means ; and if the driver is resolved to use compulsion, we would recommend that it should not be attempted unless there is a wide space, where by tight reining the driver may back him in the particular direction which he wishes, and it would be very desirable to do so up-hill if the ground inclines in the neighbourhood. But still there is considerable danger in the attempt.

Gibbing and backing are frequently produced by the pain inflicted on a horse where the collar is tight or does not fit. Some horses have also a great dislike to a cold collar, and when this is the case, it ought to be lined with cloth instead of leather, or a false collar or strip of cloth may be worn round the shoulders. Many horses, not otherwise gibbers,

will not start if their shoulders have been chafed with the collar and has left a rawness, as the coldness of the collar gives considerable pain ; but after the collar becomes of the same temperature as the animal, then he will go on. To prevent unpleasantness of this kind it would be well to warm the collar at a fire before putting it on. Some horses, which were inveterate gibbers, have been cured of this vice by constantly wearing a false collar ; while others have been reformed by keeping the ordinary collar on night and day. This is, however, not to be recommended, as it interferes with the animal's rest.

Many horses are such determined gibbers that they will never cure. When this is the case, they should be sold to the owners of a stage-coach, in which four-in-hand are driven, and if placed as the near wheeler, they will be forced to do their work. Some have also been worked in a team by farmers ; but nobody would think of keeping an animal which can only occasionally be rendered serviceable.

KICKING.

The vice of kicking is too often caused by horses being teased, tickled, and pinched by grooms, from wanton mischief or thoughtless folly. The habit becomes habitual with the animals, and what was at first only done in play, is exercised in anger, and often too when one least expects it. In short, it is a dangerous and incurable vice.

Horses with an irritable or fidgety disposition kick the stall or bail, and especially during the night. This is a great annoyance to other horses in the stable, and breaks their rest. Besides, the animal is liable to injure himself seriously, and bring on swelled hocks or other malady. Mares are more given to this than horses ; and in either it is difficult to eradicate if once confirmed. As soon as it is

discovered that a horse has this vice, a furze or thorn-branch should be fixed to the partition or post ; and few horses will continue to kick when they are pricked at every attempt. Many cures have been effected by this simple means, although cases have occurred where it was not a remedy. The next remedy is to have recourse to the log. This consists of a heavy piece of wood attached to a chain, and buckled a little way above the hock, so as to reach half way down the leg. As often as the horse kicks, he receives a severe blow from the log ; and he soon learns to desist, finding the pain which it inflicts. However, not unfrequently considerable injury is done to the limbs, by the bruises and severe swellings which have followed.

Kicking is a dangerous vice, especially with horses used in harness ; bad with a chaise, but much more so with a gig behind them. The slightest touch on their quarters, even by the reins touching, will set them to kicking ; and in many instances the bottom of the chaise will be driven in, or a gig may be battered to pieces, and the horse, frequently coming off with a broken limb, or the driver may sustain serious injury. With kicking horses, the greatest care should be taken not to allow the harness to pass under the tail, as the moment they feel it, the tail is pressed suddenly and tightly down, so much so, that it is impossible to extricate the reins ; and the more the driver pulls, the more the animal kicks and plunges. When the driver finds that the reins are so entangled, he should on no account attempt to extricate them by pulling, but quietly dismount, and relieve them by lifting the tail gently.

This vice is seldom eradicated. Where persons cannot afford to part with such horses, as they must be sold at a great loss, a strong kicking strap may be used, which circumscribes the use of the hind limbs, and prevents the

horse from raising them to kick. But even this is no security, as by violent efforts on the part of the animal the strap may break, and no one can tell what may be the consequence. I had a particularly handsome and powerful mare which possessed this vice, and although I adopted every means to break her of it, I found it impossible. I sold her, and the person who bought her was sure he could effect a cure ; but he was mistaken, and he parted with her. Her fine form soon found a ready purchaser, and in six months she was in the hands of eight different persons. Never trust a kicker.

BITING.

This trick often proceeds from play, and is taught by the folly of grooms or stable-boys teasing the animals. But what they have thus acquired as sport, becomes a fixed habit ; and when thwarted in any manner, they will sometimes bite with great severity. Like other vices, this is difficult of cure, and it is but seldom they can be really broken of it. Teazing a horse should be strictly forbidden, and the groom or stable-boy severely punished when detected in the act. Biting, like other vices, should never be taught the animal, as it is easier to avoid it than to effect a cure. Gentle treatment is the best suited for all our domestic animals, and the surest way to command their affections. Bad-tempered and tricky grooms ought to be scouted by every one ; and any master giving such a person a character, is highly culpable, and ought to be held up to public scorn.

SEIZING THE CHEEK OF THE BIT.

Some horses are so cunning as to get the cheek of the bit into their mouth, which gives them a great command over

their rider or driver. There is no cure for this ; and the only thing that can be done is to fasten a round piece of leather, or use some other mechanical contrivance, so that the animal cannot possibly get the cheek of the bit into his mouth. Neither soothing nor beating will remedy this trick, as the horse who has once been guilty of it is sure to seize the first opportunity to repeat it, when anything vexes him. Many very serious accidents have happened to persons from horses running away with the cheek-bit between their teeth.

RUNNING AWAY.

The only thing that can be done in this case is to use a strong curb with a sharp bit, and at the same time always keeping a firm bridle-hand. But if in spite of these precautions he does run away, if there is plenty of open space, or a ploughed field at hand, turn him into it, and apply the curb, spur, and whip, as vigorously as possible, and make him run until he is heartily tired of it. If anything can effect a cure, this will. Some horses only bolt off when they hear the cry of the hounds, and will not be restrained while the chase continues ; other horses seem to be well aware when they are mounted by unskilful riders, and endeavour by bolting to throw them off ; while some vicious, headstrong animals bolt even with the best of riders.

SHYING.

Of all the vices incidental to the horse, shying is one of the worst, and more accidents have happened from it than any other of the vices or defects of a horse. Shying proceeds from various causes, but one of the principal is defective vision ; timidity stands next ; and it often proceeds from a disposition to be playful. This vice is far less com-

mon among high-bred horses than with those which are half-bred, although we have met with it in some of our first racers.

When we have a horse given to shying, our first attention should be directed to the cause ; that is, whether it proceeds from friskyness, timidity, or defective vision.

When shying proceeds from playfulness, it is difficult to judge what mode of cure is best to be adopted, because if corrected for it, he will associate with any object that diverts his attention the infliction of punishment, which will tempt him to run away, under the dread of a flogging ; and if caressed for the fault, it is liable to induce him to repeat it. But, of two evils, gentle correction must be adopted, and rather to pass by the object than to take him up to it. He should also be spoken to sharply.

If shying proceeds from fear of new objects, the true way to correct him of this is not to force him up to them, but to pat him and soothe him, but avoid beating ; and take care to pass the objects of his fear again and again, always going nearer to them every time you pass. This will familiarize him to them. Seeing that these are harmless, he will soon learn to pass by unnoticed any novel object which he may meet with upon a road.

When an animal is given to shying from defective sight, the only method to effect a cure is to take him up to it, and in the act of doing so he must be coaxed to approach it, and on no account must he be beaten ; and although it sometimes happens that the horse will manifest great reluctance to do so, he should be persevered with, and not allowed to proceed until he has seen closely the object of his fear. After he has been a few times thus treated, he will soon learn to pass with indifference any object which he may meet.

We cannot better define the folly of beating a horse for shying than by the following, which we extract from "The Veterinarian :"—"We will suppose a case, an every-day one. A man is riding a young horse upon the high-road in the country, and meets a stage-coach. What with the noise, the bustle, the imposing appearance altogether, and the slashing of the coachman's whip, the animal at the approach erects his head and crest, pricks his ears, looks affrighted, and no sooner comes alongside of the machine than he suddenly starts out of the road. His rider, annoyed by this, instantly commences a round of castigations with whip, spur, and curb, in which he persists until the horse, as well as himself, has lost his temper, and then one whips, spurs, and pulls, and the other jumps, plunges, and frets, and throws up his head, until both, pretty well exhausted by the conflict, grow tranquil again, and proceed on their journey, though not for some time afterwards, in their former mutual confidence and satisfaction. Should they on their road, or even on a distant day, meet with another coach, what is the consequence? That the horse is not only more alarmed than before, but now, the moment he has started, being conscious of his fault, and expecting chastisement, he jumps about in fearful agitation, making plunges to strike into a gallop, and attempting to run away. So that by this correction, instead of rendering his horse tranquil during the passage of a coach, the rider adds to the evil of shying that of subsequently plunging, and perhaps running away."

If a horse is aged and prone to shying, and will not be broken of it by gentle treatment, then severe measures must be resorted to. Many years ago, I rode a remarkably spirited and active hackney, which was much given to shying, and particularly in the evening or at night, although he had no defect in his sight. About a mile from my

residence there was a salt-work. The first time I had occasion to pass this at night, the flames were issuing from the top of the furnace. My horse came to a stand when within about fifty yards from it, and neither coaxing nor force would induce him to proceed. I turned his head homewards, and applied both whip and spur smartly, and galloped him at full speed to my gate ; I then drew up, and turning round, returned at a sharp trot, and on coming up to the salt-work, he passed it without manifesting any signs of fear, and never afterwards showed the slightest reluctance to proceed when he came to it.

Some horses have a trick of shying on coming out of the stable. This is acquired by having received some injury while entering the door, or striking his head against the top of the doorway if too low. This is incurable, so far as I know ; for both kind treatment and severity have been tried without success.

RESTIFFNESS, AND RESISTING BEING MOUNTED.

Some horses which possess a lively or impatient temper, manifest a desire to start off before the rider can get seated in the saddle. Indeed some will attempt to set off whenever the foot is put in the stirrup. This is a troublesome and dangerous fault, even with the most expert horseman, and especially so to those who are inexperienced or infirm. Horses sometimes become so cunning that they know a good from a bad horseman, and finding they are either to be, or actually mounted, by a timid or indifferent rider, will endeavour to throw him off, or bolt away before he is properly seated.

The horse mentioned in the preceding article on shying, when I first had him, exhibited the utmost reluctance to be mounted ; so much so, that it was impossible to succeed

without some one holding his head ; and no sooner did the servant quit the reins, than he plunged and leaped about in all directions. However, I refrained from flogging or spurring him, but patted him on the neck until he became quiet. I overcame this by making the groom hold his head, while I mounted and dismounted a dozen or more times successively. After repeating this once or twice a day for upwards of a week, I then led him out to a broad garden walk, and commenced by patting him on the neck and shoulder, and then putting my foot in the stirrup, quickly mounted him. When seated, I gently walked him about, soothing and speaking kindly to him all the while ; and then dismounted, and led him about for a few minutes, and again mounted many times, which he became quite reconciled to. This I repeated several times daily for about a week, but never rode him out of the grounds during this time. At last he became so tractable by kind treatment that he never afterwards was troublesome to mount. I sometimes rewarded him with a handful of oats while pursuing this treatment. When a horse has such a propensity, he should be mounted quickly and without fear, and not allowed to proceed on his journey until he is perfectly quiet. Instances are not few where horses that are generally pleasant and easy to mount, become restiff when too high fed and having too little work. The remedy for this is obvious. But when animals continue to manifest this vice, they should be sold.

VICIOUS WHILE CLEANING.

Very great difference exists in the temper exhibited by horses under the operation of cleaning. Some that are steady and quiet on the road and in the field, cannot be caned without great hazard to their grooms, as well as the

danger of laming themselves. This often proceeds from a very sensitive skin, and at other times from their grooms having inflicted severe chastisement on some former occasions when cleaning. Besides, ill-disposed grooms, by teasing the animals, or currying them with a broken-toothed comb or uneven-surfaced brush, teach them this bad habit, and have even a delight in seeing the animals show their teeth ; and this is continued until it becomes a fixed vice. If a change of groom takes place, what was done partly in play is then manifested in anger, and serious injuries have been inflicted upon the unsuspecting stranger. It therefore behoves grooms to be cautious how they handle a strange horse.

There is much variety in the sensibility of the skin of horses, some being so tender that moderate rubbing gives them uneasiness, while others are so much the reverse that the whip hardly excites it.

It will not be difficult to overcome this vicious habit. When the groom discovers it, the best plan is to use a gentle hand while cleaning, and lean lightly on those parts which seem most sensitive ; and avoid punishing the animal for exhibiting restiffness, and he will soon lose all recollection of the former ill-treatment which he had received from his groom, and become quiet and steady.

RESTIFFNESS WHILE SHOEING.

When a young horse is first shod, great caution should be used, and gentle means adopted to induce the animal to submit to this novel operation ; and it would be much better to pay the smith a small gratuity for his loss of time in coaxing the horse to submit to it, than to use the gag hurriedly. It must naturally be expected that a young animal will exhibit uneasiness for the first few times he is taken to the smithy.

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He should on each occasion be led thither by the person who feeds him ; and above all things the smith must not strike him for a fault ; as in most instances horses which are vicious under the operation of shoeing, are rendered so by severe treatment either by the smith or groom. Patience at first shoeing will be well rewarded, and when the animal finds he receives no injury, he will soon become obedient under this necessary operation ; but if severe chastisement has been resorted to, he is certain to be troublesome every time he is shod, having in remembrance his former treatment, and the pain he suffered under the twitch and the gag. The business of the smith is to be mild and yet firm. Shoeing a quiet horse in the presence of a young one has had the effect of teaching him to submit to it. For his own sake, the smith should avoid teaching this evil, as he is in constant danger during the operation ; and the horse is liable to be pricked and lanced in his struggles. Some horses are so vicious that they never can be conquered, and it becomes necessary to cast them every time they are shod, and confined in the trevis. When this is the case, it may be expected that sooner or later the animal will meet with an accident which will render him useless.

CRIB-BITING.

Crib-biting is one of the worst habits which a horse can acquire, and is seldom or ever cured. The horse seizes the manger with his teeth while he stretches his neck forward, and after some spasmodic action of the throat, a slight grunting sound is uttered, which appears to be accompanied by a drawing in of air. The cause of this trick is not yet well understood ; and whether it proceeds from a bad habit, or a defect in the formation of the soft palate and back part of the mouth, still remains undiscovered ; and there-

fore we shall not indulge in any speculative opinions as to its origin.

One serious effect of this trick is the wearing down of the teeth ; and instances have occurred where they have been broken. It has likewise been found that crib-biters are more liable to colic than those without this vice. Whether this proceeds from the loss of saliva occasioned by the wearing down of the teeth is still an unsettled point.

It has been found that crib-biting is acquired by horses being in the stable with one which has the trick. Among the expedients which have been resorted to for the cure of crib-biting, the edge of the manger has been lined with iron ; also with sheep-skin besmeared with aloes, tar, and other disagreeable substances, but all with no effect. The only thing in this case is to resort to a preventive, and that will be found in the use of a strap buckled tightly round the neck, which has the effect of compressing the windpipe, and rendering it impossible to resort to it ; but no sooner is the strap removed, than the horse recommences his old habit, so that it must be constantly worn to be of use. But the continual use of it is apt to produce irritation in the trachea, and this will terminate in the affection termed roaring, which we have particularly described at page 76. A five or six months' run in a field has also been tried without proving a remedy. Crib-biters are generally in low condition.

A muzzle barred across the bottom will prevent crib-biting. This must be made only of sufficient width to allow full action to the lips, so that the animal may pull his hay from the rack and eat his corn, but so close as not to admit of him grasping the edge of the manger. Crib-biting is legally considered unsoundness.



